May 31, 1974 11

GOVERNMENT REPORTS ANNOUNCEMENTS

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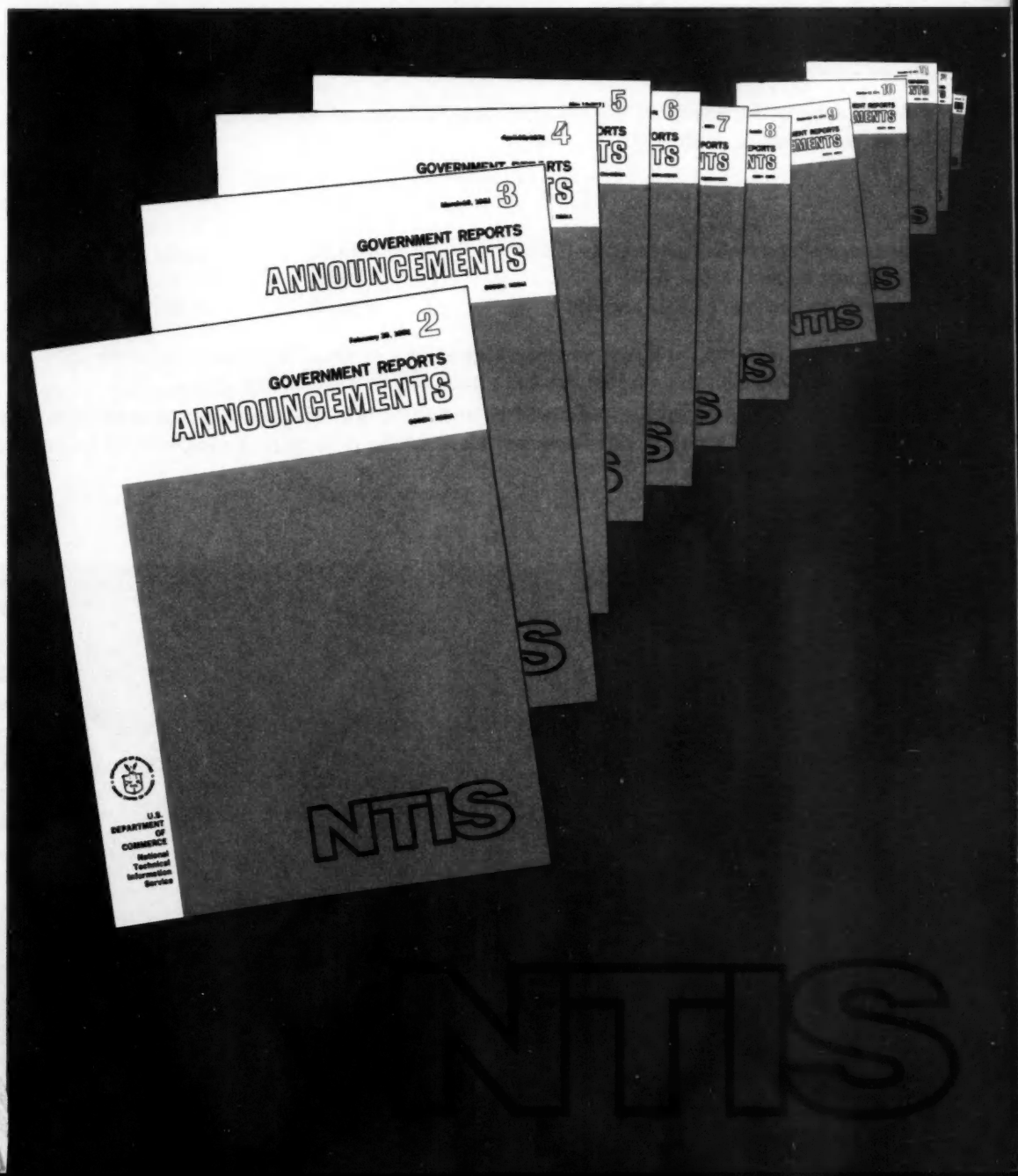

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GOVERNMENT REPORTS ANNOUNCEMENTS

Volume 74, Number 11 ◆◆◆ May 31, 1974

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INDEXES. Corporate Author, Subject, Personal Author, Contract Number, and Accession/Report Number Indexes are published in the corresponding issue of Government Reports Index (GRI).

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GOVERNMENT REPORTS ANNOUNCEMENTS

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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

AD-776 372/5GA PC$4.75/MF$1.45
Tennessee Univ Knoxville Dept of Mechanical and Aerospace Engineering
THE PREDICTION AND MEASUREMENT OF OVERPRESSURES FROM ROCKET MOTOR BLAST WAVES ON HELICOPTER SURFACES.
Final technical rept.,
J. P. Kesselring, M. W. Milligan, and J. S. Tennant.
31 Dec 71, 33p RL-74-3
Contract DAHC04-72-A-0001

Descriptors: *Overpressure, *Rocket exhaust, *Blast, *Aerodynamic characteristics, *Helicopters, Mathematical models, Mathematical prediction, Recoilless guns, Surface properties, Shock waves, Computerized simulation, Plumes, Theory.

An empirical model applicable to blast fields generated by recoilless rifles in a free-field environment yields reasonable predictions of transient overpressure resulting from rocket exhaust blast. A second model of the recoilless rifle type is presented for conditions where reflecting surfaces are present. Using the free-field model, the upper bounds of pressure can be predicted at fixed points knowing the rocket chamber pressure and its nozzle exit diameter. (Author)

AD-776 415/2GA PC$5.00/MF$1.45
Boeing Vertol Co Philadelphia Pa
INVESTIGATION OF THE EFFECT OF TORSIONAL NATURAL FREQUENCY ON STALL-INDUCED DYNAMIC LOADING.
Final technical rept. Jul 72-Jul 73,
F. J. Tarzanin, and Joseph Ranieri. Feb 74, 163p
Rept no. D210-10678-1 USAAMRDL-TR-73-94
Contract DAAJ02-72-C-0093

Descriptors: *Helicopters, *Aerodynamic loading, *High velocity, *Rotary blades(Rotary wings), *Stalling, Flight, Control, Torsion, Angle of attack, Dynamic loads, Propulsion systems, Frequency.
Identifiers: Stall induced loading.

For helicopter flight conditions at high blade loadings or airspeeds, the rotor control system experiences a rapid load growth resulting from stall-induced blade torsional moments. These loads frequently grow so large that the aircraft flight envelope is restricted. This report describes an analytical study that determined the effect of changing blade torsional properties on control loads for a wide range of flight conditions. (Modified author abstract)

N74-16719/8GA PC$5.50/MF$1.45
Nielsen Engineering and Research, Inc., Mountain View, Calif.
CALCULATION OF THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF STOL AIRCRAFT WITH EXTERNALLY-BLOWN JET-AUGMENTED FLAPS.
Final Report.
M. F. E. Dillenius, M. R. Mendenhall, and S. B. Spangler. Feb 74, 197p NASA-CR-2358
Contract NAS2-5247

Descriptors: *Aerodynamic characteristics, *Jet flaps, *Longitudinal stability, *Short takeoff aircraft, Aircraft wakes, Flow distribution, Flow geometry, Lift devices, Load distribution (Forces).

For abstract, see STAR 1208

N74-16724/8GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
APPLICATION OF THE METHOD OF INTEGRATING MATRICES FOR CALCULATING THE NATURAL OSCILLATIONS OF A PROPELLER BLADE WITH CONSIDERATION OF DEFLECTION IN TWO PLANES AND TWISTING.
A. Y. Liss, and G. U. Margulis. Feb 74, 17p
NASA-TT-F-15365
Contract NASW-2483
Tran-Transl. Into English from Izv. Vysshikh Uchebn. Zavedenii, Aviats. Tekhn. (Kazan), V. 16, No. 1, 1973 p 30-37.

Descriptors: *Aerodynamic characteristics, *Performance prediction, *Propeller blades, Applications of mathematics, Mathematical models, Numerical analysis.

For abstract, see STAR 1208

N74-16726/3GA PC$5.75/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash.
THE RESULTS OF A HIGH-SPEED WIND TUNNEL TEST TO INVESTIGATE THE EFFECTS OF THE NASA REFAN JT8D ENGINE NACELLES ON THE STABILITY AND CONTROL CHARACTERISTICS OF THE BOEING 727 AIRPLANE.
E. A. Kupcis. Dec 73, 52p NASA-CR-134545, D6-41499
Contract NAS3-17842

Descriptors: *Aerodynamic configurations, *Aircraft stability, *Boeing 727 aircraft, *Wind tunnel stability tests, Aircraft design, Nacelles, Test facilities, Transonic wind tunnels.

For abstract, see STAR 1208

N74-16731/3GA PC$7.75/MF$1.45
Institut de Mecanique des Fluides de Marseille (France).
STUDY OF DETACHMENT ON THE REAR BLADE OF A HELICOPTER ROTOR ETUDE DU DECROCHAGE SUR LA PALE RECULANTE D'UN ROTOR D'HELICOPTERE.
Final Report.
C. Maresca, J. Rebont, and N. Pellerin. Nov 73, 91p E-172
Language in French.

Descriptors: *Helicopter performance, *Rotary wings, *Separated flow, Coefficient of friction, Pressure gradients, Three dimensional boundary layer.

For abstract, see STAR 1208

N74-17611/6GA PC$3.75/MF$1.45
Wisconsin Univ., Milwaukee.
SENSITIVITY ANALYSIS OF TORSIONAL VIBRATION CHARACTERISTICS OF HELICOPTER ROTOR BLADES. PART 2: AERODYNAMICS AND SENSITIVITY ANALYSIS.
T. Bratanow, and A. Ecer. Mar 74, 64p NASA-CR-2380
Contract NGR-50-007-001

Descriptors: *Aerodynamic loads, *Rotary wings, *Torsional vibration, Degrees of freedom, Dynamic response, Equations of motion, Mathematical models, Oscillations.

For abstract, see STAR 1208

1B. Aeronautics

AD-776 316/2GA PC$4.50/MF$1.45
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
OPTIMAL CONTROL AIRCRAFT LANDING ANALYSIS.
Technical rept. Jan 72-Jul 73,
Robert E. Huber, Jr. Dec 73, 136p Rept no. AFFDL-TR-73-141

Descriptors: *Aircraft landings, *Landing aids, *Microwave equipment, *Automatic pilots, Computer applications, Mathematical prediction, Performance(Engineering), Visibility, Trajectories, Optimization, Statistical analysis, Mathematical models, Atmospheres, Noise(Electrical and electromagnetic).
Identifiers: *Microwave landing systems.

A digital computer analysis technique was developed to predict aircraft longitudinal landing performance to touchdown. A microwave landing system provided sampled data elevation angle guidance and assumed continuous DME (distance measuring equipment) information. The linearized longitudinal equations for perturbations about trimmed flight were used for the aircraft model. Atmospheric disturbances including deterministic winds and random gusts were modeled. The deterministic gusts included headwinds and wind shears. The random gusts included longitudinal and normal gusts which were modeled as first order Gauss Markov processes. The microwave landing system noise was also included. (Modified author abstract)

AD-776 695/9GA PC$7.50/MF$1.45
Raytheon Co Sudbury Mass Equipment Development Labs
AIRBORNE WAKE VORTEX DETECTION.
Final rept. Sep 72-Mar 73,
J. D. Fridman. Mar 74, 89p TSC-FAA-74-3, FAA-RD-74-46
Contract DOT-TSC-522

Descriptors: *Wake, *Transport aircraft, *Hazards, *Detection, Vortices, Airports, Aviation safety, Remote detectors, Feasibility studies, Sensitivity, Onboard, Modification, Radar equipment, Carbon dioxide lasers, Radiometry, Systems engineering.
Identifiers: *Remote sensing.

The vortices generated by large aircraft can create dangerous encounter situations with other airplanes as a result of their slow dissipation rates or in conjunction with unfavorable meteorological conditions that prolong their presence over a runway. Active and passive remote sensing systems were assessed to determine the feasibility of detecting aircraft trailing vortices using instrumentation on-board an aircraft. It was found that a modification of the front-end receiver of a 10 GHz weather radar system or a change of frequency to 35 GHz may allow vortex identification over a range of several kilometers. The CO2 laser coherent Doppler radar technique and passive radiometric techniques show considerable promise.

AD-776 963/1GA PC$4.75/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
SMOKE EMISSION FROM BURNING CABIN MATERIALS AND THE EFFECT ON VISIBILITY IN WIDE-BODIED JET TRANSPORTS.
Final rept. 1972-1974,
Edward L. Lopez. Mar 74, 127p Rept no. FAA-NA-73-155 FAA-RD-73-127
Contract DOT-FA72NA-665

Descriptors: *Aircraft cabins, *Smoke, Jet transport planes, Emission, Experimental design, Materials, Visibility, Combustion, Heat flux, Test methods, Crash resistance, Aircraft fires.

A study was made of the smoke emission of cabin materials in ten major categories of aircraft interior construction under various burning conditions. Two materials in each category tested represented high to low smoke emission values. A wide-bodied cabin mockup, 2774 cubic feet in volume was used to establish correlation with the 18 cubic foot NBS-type smoke chamber. Additionally, selected materials were tested in the wide-bodied mockup to relate human visual acuity to optical density with and without ventilation flow through the mockup. (Modified author abstract)

JPRS-61482 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
SCIENCE AND TRANSPORT,
I. Ya. Aksenov. 14 Mar 74, 49p
Trans. of mono. Nauka i Transport, Moscow, 1974 64p.

Descriptors: *Transportation, *Scientific research, USSR, Marine engineering, Aircraft, Aeronautics, Translations.

The report contains data on the association of transport to science and engineering and treats the basic scientific and technical problems within transport.

N74-16717/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
A SIMPLIFIED FLIGHT-TEST METHOD FOR DETERMINING AIRCRAFT TAKEOFF PERFORMANCE THAT INCLUDES EFFECTS OF PILOT TECHNIQUE.
T. J. Larson, and W. G. Schweikhard. Feb 74, 41p
NASA-TN-D-7603, H-802

Descriptors: *Aircraft performance, *Flight tests, *Pilot performance, *Takeoff, B-70 aircraft, Ground speed, Lift drag ratio, Rotation.

For abstract, see STAR 1208

N74-16720/6GA PC$7.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPUTER PROGRAMS FOR ESTIMATING AIRCRAFT TAKEOFF AND LANDING PERFORMANCE.
J. V. Bowles, and T. L. Galloway. Jul 73, 84p
NASA-TM-X-62333

Descriptors: *Aircraft landing, *Aircraft performance, *Computer programs, *Performance prediction, Aerodynamic characteristics, Aerodynamic forces, Flight control.

For abstract, see STAR 1208

N74-16995/4GA PC$12.00/MF$1.45
American Airlines, Inc., Tulsa, Okla.
FLIGHT EVALUATION OF TWO SEGMENT APPROACHES FOR JET TRANSPORT NOISE ABATEMENT.
R. A. Rogers, B. Wohl, and C. M. Gale. Jun 73, 180p NASA-CR-114735
Contract NAS2-6501

Descriptors: *Aircraft noise, *Flight tests, *Noise reduction, Aircraft instruments, Approach, Glide paths, Transport aircraft.

For abstract, see STAR 1208

PB-229 826/3GA PC$3.75/MF$1.45
Department of Transportation, Washington, D.C.
AIRPORT AND AIRWAY COST ALLOCATION STUDY. DETERMINATION, ALLOCATION AND RECOVERY OF SYSTEM COSTS. PART I. REPORT TO THE CONGRESS.
Sep 73, 60p*

Descriptors: *Civil aviation, *Airports, *Air traffic control, *Cost allocation, Taxes, Financing, Federal expenditures, Air transportation, Commercial aircraft.

The Airport and Airway Development and Revenue Act of 1970 directed the Secretary of Transportation: (1) to determine the costs of the Federal Airport and Airway System; (2) to determine how these costs should be allocated among the various users; and (3) to recommend equitable ways of recovering these costs. This report, which is Part I of a two-part report, provides the requested information.

PB-230 694/2GA PC$3.25/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
AIRCRAFT ACCIDENT REPORT. LOFTLEIDIR ICELANDIC AIRLINES, INC. DOUGLAS DC-8-61, JOHN F. KENNEDY INTERNATIONAL AIRPORT JAMAICA, NEW YORK, JUNE 23, 1973.
5 Dec 73, 34p NTSB-AAR-73-20, File-A-0003

Descriptors: *Aviation accidents, *Accident investigations, Instrument landing, Approach, Spoilers, Collision research, Transport aircraft.
Identifiers: DC-8 aircraft.

On June 23, 1973, Loftleidir Icelandic Airlines, Inc., Flight 509, a scheduled passenger and cargo flight, was involved in a landing accident after an instrument landing approach to runway 31R at the John F. Kennedy International Airport, Jamaica, New York. Of the 119 passengers and nine crewmembers aboard the flight, six passengers and two stewardesses were injured seriously; there were no fatalities. The aircraft was damaged substantially. When the aircraft was about 40 feet above the runway, the ground spoilers were inadvertently deployed. The aircraft descended rapidly and hit the ground, tail-first, 20 feet short of the displaced runway threshold. The National Transportation Safety Board determines that the probable cause of the accident was the first officer's inadvertent deployment of the ground spoilers in flight while he was attempting to arm the spoiler system.

1C. Aircraft

AD-776 297/4GA PC$3.25/MF$1.45
Honeywell Inc Minneapolis Minn Systems and Research Div
APPLICATION OF PRACTICAL OPTIMAL CONTROL THEORY TO THE C-5A LOAD IMPROVEMENT CONTROL SYSTEM (LICS).
Final technical rept. 15 Aug-15 Sep 72,
Albert J. VanDierendonck, Charles R. Stone, and Michael D. Ward. Oct 73, 40p Rept no. F0161-FR-Vol-3 AFFDL-TR-73-122
Contract F33615-72-C-2008

Descriptors: *Cargo aircraft, *Flight control systems, Feedback, Control theory, Standard deviation, Stresses, Experimental design, Iterations.
Identifiers: C-5 aircraft, C-5A aircraft, Design criteria.

Practicalizing quadratic optimal control algorithms were used to design load relief systems for the C-5A, a large flexible aircraft. The predicted rms stresses at the wing root were reduced by more than 40 percent. Handling qualities or stability were not compromised. The control is realized with a gyro and three accelerometers affecting ailerons and elevator - two accelerometers more than an existing stability augmentation system. The quadratic performance index is defined to enforce good handling qualities and to limit the control system bandwidth. (Author)

AD-776 301/4GA PC$3.75/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
AEROSPACE VEHICLE HAZARD PROTECTION PROGRAM: DETECTORS; MATERIALS; FUEL VULNERABILITY.
Final technical rept. 10 Oct 70-30 Sep 72,
John H. O'Neill, Daniel E. Sommers, and Eldon B. Nicholas. Oct 73, 63p Rept no. FAA-NA-73-63
AFAPL-TR-73-87
Contract F33615-71-M-5002

Descriptors: *Jet aircraft, *Fire hazards, Fire detectors, Fire resistant materials, Aircraft fires, Fire resistance, Jet engine fuels, Fire safety.

Fire tests were conducted in a turbojet powerplant installation to determine the effectiveness of an Edison and a Honeywell Ultra-violet Fire Detection System. A study of flammability and smoke generation characteristics was performed on different types of litter pads and pillows. Fire resistance tests in a standard 2,000F flame-test environment were conducted on two flexible self-sealing low pressure Aeroquip hoses and an aluminized asbestos-faced flexible fiberglas cloth. An investigation of the vulnerability of JP-4 and JP-8 fuel, contained in a fuel tank, to ignition by incendiary gunfire was made. (Modified author abstract)

AD-776 359/2GA PC$4.75/MF$1.45
Army Aviation Systems Test Activity Edwards AFB Calif
ENGINEERING FLIGHT TEST - AH-1G HELICOPTER WITH MODEL 212 TAIL ROTOR. PART I. LOAD SURVEY.
Final rept. 19 Mar-9 May 73,
Leslie J. Hepler, Gary L. Skinner, Gary A. Smith, and Paul R. Bonin. Jun 73, 128p Rept no. USAASTA-72-30-Pt-1
See also Part 2, AD-776 360.

Descriptors: *Helicopters, *Tail helicopter rotors, Tail rotors, Flight testing, Aerodynamic loading, Hovering, Ground effect.
Identifiers: H-1 aircraft, AH-1G aircraft, Model 212 tail rotors, Huey Cobra.

The United States Army Aviation Systems Test Activity conducted a limited tail boom flight load survey of the AH-1G helicopter equipped with a Model 212 tail rotor. Tests were performed to obtain base-line tail boom load data with a tractor tail rotor installation, then repeated with the Model 212 tail rotor installed on the same helicopter. This installation included changes to the pitch links and pitch control tube to accommodate the Model 212 tail rotor; however, the remaining components of the tail rotor drive system were standard AH-1G items. (Modified author abstract)

AD-776 360/0GA PC$4.50/MF$1.45
Army Aviation Systems Test Activity Edwards AFB Calif
ENGINEERING FLIGHT TEST - AH-1G HELICOPTER WITH MODEL 212 TAIL ROTOR. PART II. PERFORMANCE AND HANDLING QUALITIES.
Final rept. 29 May-7 Aug 73,
John I. Nagata, Gary L. Skinner, Leslie J. Hepler, Gary A. Smith, and Paul R. Bonin. Sep 73, 121p
Rept no. USAASTA-72-30-Pt-2
See also Part 1, AD-776 359. Errata sheet inserted.

Descriptors: *Helicopters, *Tail helicopter rotors, Tail rotors, Flight testing, Handling, Hovering, Ground effect.
Identifiers: H-1 aircraft, AH-1G aircraft, Model 212 tail rotors, Huey Cobra.

The United States Army Aviation Systems Test Activity conducted a limited performance and handling qualities evaluation of the AH-1G helicopter with a Bell Helicopter Company commercial Model 212 tail rotor installed. This installation included changes to the pitch links and pitch control tube to accommodate the Model 212 tail rotor; however, the remaining components of the tail rotor drive system were standard AH-1G items. The evaluation was performed during the period 29 May to 7 August 1973 at Edwards Air Force Base, Bakersfield, and Bishop, California. (Modified author abstract)

AD-776 363/4GA PC$3.75/MF$1.45
Defense Systems Management School Fort Belvoir Va
RETURN TO LIGHTER-THAN-AIR TRANSPORTATION FOR MILITARY AND CIVILIAN APPLICATION.
Student study rept.,
Richard M. Stepler. Nov 73, 52p Rept no. DSMS-PMC-73-2
Report on Program Management Course.

Descriptors: *Airships, *Military transportation, *Civil aviation, Feasibility studies, Air transportation, Cost effectiveness, Air pollution, Abatement, Payload, Landing fields, Flight.
Identifiers: *Dirigibles, Blimps, Aluminum shells.

The United States aerospace community has entered an era characterized by declining activity, due largely to the increasing complexity and cost of aerospace systems. Industry and Government are engaged in a search for air vehicles that will carry increasingly larger payloads at reduced cost and levels of pollution, and that will not require vast expanses of land from which to operate. To this end, the dirigible (rigid airship), a versatile and ecologically clean transportation system which offers exceptional payload capability, endurance, range and flight stability, may be given renewed consideration. (Author)

AD-776 397/2GA PC$6.00/MF$1.45
Ohio State Univ Columbus Dept of Mechanical Engineering
VIBRATION SIGNAL ANALYSIS TECHNIQUES.
Final rept. 1 Jul 72-15 Jun 73,
Donald R. Houser, and Michael J. Drosjack. Dec 73, 245p USAAMRDL-TR-73-101
Contract DAAJ02-72-C-0085

Descriptors: *Helicopters, *Drives, *Monitoring, Power, Monitors, Vibration, Gears, Bearing, Diagnosis(General), Detectors.

The program was initiated to investigate the many means of using vibration signals to detect the condition of mechanical components, with particular emphasis on gears and bearings in the helicopter power train. An exhaustive literature search was performed in which specific techniques were identified. Several visits were made to people active in the vibration diagnostics field. The techniques which were identified as being potentially useful were investigated in detail. The results of this investigation include a presentation of the state of the art of each technique and an analysis via actual helicopter data, test rig data, and a dynamic model simulation. The techniques have been broken down by mathematical function, i.e., time domain and frequency domain, and also by the components being monitored, i.e., gears or bearings. Both mechanically related and pattern recognition techniques are discussed. An extensive reference listing and a listing of companies and agencies active in diagnostics work are included. (Modified author abstract)

AD-776 418/6GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS). CH-47A SYNCHRONIZER SHAFT ASSEMBLY.
Interim rept. Jan 64-Jul 73.
Mar 74, 22p Rept no. USAAVSCOM-TR-74-14

Descriptors: *Helicopters, *Shafts(Machine elements), *Value engineering, Logistics, Quality control, Spare parts, Maintainability, Cost analysis, Failure.
Identifiers: H-47 aircraft, CH-47A aircraft, MISS(Major Item Special Studies), Major item special studies, *Logistics management, *Failure analysis.

Major Item Special Study (MISS) reports are performed on DA Form 2410 reportable components. These are time change items and certain condition change items selected because of high cost or need for intensive management. Basically, the MISS reports are concerned with analyzing reported removal data presented in the Major Item Removal Frequency (MIRF) report. The failure modes reported for each removal are examined and grouped into categories which are intended to clarify the intent of the data reporting. From this data, removal distributions can be plotted and an MTR (mean time to removal) can be calculated. The MISS reports then investigate possible cost savings based on total elimination of selected failure modes. These modes are chosen because of the percentage of failures they represent and/or because they appear to be feasible Product Improvement Program (PIP) areas. (Author)

AD-776 419/4GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS). CH-47A ROTARY WING BLADE.
Interim rept. Jan 64-Jul 73.
Mar 74, 23p Rept no. USAAVSCOM-TR-74-15

Descriptors: *Rotor blades(Rotary wings), *Logistics planning, Helicopter rotors, Failure, Removal, Costs, Savings, Reliability.
Identifiers: CH-47A aircraft, H-47 aircraft, H-47A aircraft, *Maintenance support planning, *Maintenance management, 3-M system, *Maintenance data collection.

The report is designed to illustrate cost savings which would result from specific efforts in the areas of product improvement in quality and design. For the purpose of this study the cost savings produced in the area of product improvement are based on total elimination of a certain failure mode or modes. Appropriate modes are chosen because of their proportion of the total removals or their proportion in combination with other similar modes. These eliminated removals are then assumed to follow the distribution of the remaining removal modes. The actual cost savings are determined from the increase in the mean time to removal based on the new removal distributions.

AD-776 421/0GA PC$9.25/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
ESCAPE PROBLEMS AND MANOEUVRES IN COMBAT AIRCRAFT.
Conference proceedings no. 134,
Walton L. Jones. Feb 74, 121p Rept no. AGARD-CP-134
Presented at the Aerospace Panel Specialist Meeting. Soesterberg, Netherlands, 4 Sep 73.

Descriptors: *Escape systems, *Military aircraft, *Meetings, Human factors engineering, Ejection seats, Helicopters, Vertical takeoff aircraft, Aerospace medicine, Bioengineering, Explosive actuators, Aviation safety.

The purpose of the session was to delineate the important aspects of the escape problems in helicopters and V/STOL aircraft and to review new concepts in escape technology, including some techniques recently put into operation as well as others under test. An impressive amount of material was covered during the one day session. Fifteen papers were presented. Six of these treated escape problems in conventional and STOL aircraft. Nine presentations treated various aspects of the escape problem in helicopter aircraft. The spectrum of information covered was broad, ranging from biomedical issues in air combat mishaps in high performance aircraft to human factors and engineering aspects of inflight escape in all types of aircraft of concern.

AD-776 536/5GA PC$4.00/MF$1.45
Naval Postgraduate School Monterey Calif
FY 73 HYDRAULIC RAM STUDIES.
Final rept. 1 Jul 72-30 Jun 73,
A. E. Fuhs, R. E. Ball, and H. L. Power. Feb 74, 80p Rept no. NPS-57Fu74021

Descriptors: *Fuel tanks, *Vulnerability, *Ballistics, *Loads(Forces), Impact shock, Survival(General), Aircraft, Penetration, Shock waves, Hydrostatic pressure, Cavitation, Walls, Mathematical models, Time dependence.
Identifiers: *Hydraulic rams, *Aircraft survivability.

A report is made on the progress of FY 73 hydraulic ram studies. Preliminary analytical and experimental studies of the shock and cavity phases of hydraulic ram have been made to add to basic understanding of the fluid-structural interactions. The work should contribute to the understanding of the hydraulic ram phenomenon and provide useful information for designing survivable fuel tanks in aircraft. (Author)

AD-776 580/3GA PC$8.25/MF$1.45
Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept
HELICOPTER/TECHNOLOGY PROGRAM: FISCAL 1973 PROGRESS REPORT.
Technical note,
Peter S. Montana. Sep 73, 103p Rept no. TN-AL-310

Descriptors: *Helicopters, *Drag, Aerodynamic characteristics, Fuselages, Optimization, Flow separation, Computer programs.
Identifiers: *Design requirements.

The current fiscal year's effort in the Helicopter Technology Program was directed toward the development of a design methodology for helicopter fuselages. Effort was concentrated in the development and utilization of computer programs to design a fuselage for a high speed helicopter in the 25,000 pound gross weight class. Particular emphasis was placed on minimizing flow separation in the rotor hub-pylon region of the vehicle. The flow separation in this region was previously determined to be the cause of up to fifty percent of current helicopter drag. Measureable success has been achieved in this regard. Progress has also been made in the development of a comprehensive wind tunnel investigation (currently under way) to verify analytical predictions and further refine the design methodology being developed. (Author)

AD-776 743/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE STRENGTH AND RIGIDITY OF STRUCTURES AT HIGH AIRCRAFT VELOCITIES,
P. G. Zykin. 7 Mar 74, 16p Rept no. FTD-HT-23-395-74
Edited trans. of Aviatsionnyi Institut, Ufa. Trudy (USSR) n7 p3-12 1967, by John A. Miller.

Descriptors: *Airframes, *Aerodynamic heating, Translations, Supersonic flight, Hypersonic flight, Heat transfer, Lift to drag ratio, Thermal stresses, USSR.

AD-776 779/1GA PC$7.50/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
AN INVESTIGATION OF TECHNIQUES FOR LAUNCHING LARGE BALLOON SYSTEMS FROM AIRCRAFT OR ROCKETS IN FLIGHT.
Instrumentation papers,
Andrew S. Carten, Jr. 9 Oct 73, 90p Rept nos. AFCRL-TR-73-0633, AFCRL-IP-203

Descriptors: *Balloons, *Air launched, *Cryogenic storage devices, Tanks(Containers), Payload, Deployment, Heat exchangers, Aerial delivery.

The requirements for placing a military payload (communications relay, electro-optical sensor, etc.) in the sky at short notice are identified. A demonstration aircraft-launched balloon system is proposed and the basic assumptions defined. The balloon size and mass of inflatant to be carried aloft are calculated. Compressed gas and cryogenic storage systems are compared. The weight of storage tank/lift ratio is used to demonstrate the superiority of cryogenic storage. The properties of liquid helium and liquid hydrogen are discussed with respect to safe long term storage. The heat needed to vaporize the cryogens and to warm the resultant inflation gases is calculated. Methods of generating and transferring the required heat at the time of inflation are described. (Modified author abstract)

AD-776 868/2GA PC$4.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
TECHNICAL EVALUATION REPORT ON AGARD TECHNICAL MEETING ON V/STOL PROPULSION SYSTEMS.
Advisory rept.,
H. Grieb, and N. A. Mitchell. Jan 74, 12p Rept no. AGARD-AR-64
NATO furnished.

Descriptors: *Meetings, *Vertical takeoff aircraft, *Short takeoff aircraft, *Jet propulsion, Airframes, Aerodynamic control surfaces, Thrust augmentation, Aircraft noise.
Identifiers: Blown flaps.

Contents:
V/STOL propulsion systems;
Propulsion/airframe integration;
V/STOL propulsion system components;
Environmental effects;
V/STOL propulsion operating experience.

AD-776 981/3GA PC$15.75/MF$1.45
Bell Helicopter Co Fort Worth Tex
ANALYSIS OF MANEUVERABILITY EFFECTS ON ROTOR/WING DESIGN CHARACTERISTICS.
Final rept.,
R. D. Foster, J. C. Kidwell, and C. D. Wells. Feb 74, 252p USAAMRDL-TR-74-26
Contract DAAJ02-70-C-0031

Descriptors: *Helicopters, *Helicopter rotors, *Wings, Maneuverability, Aerodynamic forces, Stability, Optimization, Flight maneuvers.
Identifiers: *Design criteria, Winged helicopters.

A parametric study was conducted to determine the effects of maneuverability requirements on the design characteristics of rotors and wings for helicopters. The study was performed for both single-rotor helicopters and single-rotor winged helicopters. Study results indicate that for typical UTTAS configurations, both winged and pure helicopters, designed for equal maneuvering capability, had equal payload capability. Therefore, for equal maneuvering capability, there was no discernible difference in weight or overall size. Winged configurations were more limited in their ability to achieve low (i.e., near zero) g, high-speed, maneuvering flight due to the difficulty in reducing wing lift sufficiently. (Modified author abstract)

AD-776 984/7GA PC$4.00/MF$1.45
National Academy of Engineering Washington D C Aeronautics and Space Engineering Board
HELICOPTER AND V/STOL NOISE GENERATION AND SUPPRESSION.
Final rept. Nov-Dec 68.
Nov 68, 19p Rept no. NAE-ASEB-68-1
Contract DA-31-124-ARO(D)-1
Report of the results of a joint U.S. Army, National Academy of Sciences, National Academy of Engineering Conference, July 30-31, 1968.

Descriptors: *Helicopters, *Short takeoff aircraft, *Aircraft noise, Noise(Sound), Noise reduction, Aerodynamic noise, Jet engine noise, Rotor blades(Rotary wings), Research management.

Recent discussions between scientists of the United States Army Research Office, Durham, North Carolina, and members and staff of the National Academy of Sciences and National Academy of Engineering have identified an urgent need for renewed effort toward suppression of helicopter and V/STOL noise in military operations. Use of the term VTOL is intended to apply to all aircraft capable of vertical flight, of which the helicopter is the best known example. Major recommendations were: (1) Criteria should be established for determining the benefits and costs of noise reduction, on a quantitative basis in both military and commercial operations. (2) Factors determining aural detectability should be established for acoustic signatures of type generated by VTOL aircraft. Annoyance factors should also be established. (3) Mechanisms of noise generation by rotors and propellers should be established by a basic research program including analytical studies and experimental investigations. (4) Standards should be established for measurement of noise levels and data reduction which could be applied on a consistent basis by all investigators using commercially available equipment.

AD-776 991/2GA PC$6.00/MF$1.45
United Aircraft Corp Stratford Conn Sikorsky Aircraft Div
QUALIFICATION TEST METHODS FOR HELICOPTER CARGO HANDLING SYSTEMS.
Final rept. Feb-Nov 72,
David O. Adams. Dec 73, 229p Rept no. SER-50795 USAAMRDL-TR-73-77
Contract DAAJ02-72-C-0037

Descriptors: *Helicopters, *Helicopter hoists, Test methods, Cargo, Handling, Cable assemblies, Environmental tests, Reliability.
Identifiers: *Qualification tests.

The unreliability of some current cargo handling systems has resulted in the loss of expensive military equipment. Additionally, the unavailability of aircraft and the many maintenance man-hours on cargo handling systems have caused increased costs and mission aborts. The basic reason for this has been a lack of appreciation, by both the Army and the helicopter manufacturer, for the rigors of cargo helicopter operation. Southeast Asia experience has shown that rough handling and the combined effects of extreme environmental conditions and operational cycles are the leading causes of cargo handling system failures. The purpose of the report is to present cargo handling system qualification test methods which better represent actual field use and to systematize methods for demonstrating stated reliability requirements for these devices. (Modified author abstract)

AD-776 992/0GA PC$25.50/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
V/STOL PROPULSION SYSTEMS.
Conference proceedings.
Jan 74, 450p Rept no. AGARD-CP-135
Papers and discussions presented at the Meeting of the AGARD Propulsion and Energetics Panel (42nd) held at the Kurhaus, Schliersee, Germany, 17-21 September 1973. NATO furnished.

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, *Meetings, *Aircraft engines, Aerodynamic control surfaces, Aerodynamic forces, Thrust vector control systems, Jet engines, Noise reduction, Captive tests.
Identifiers: *Blown flaps.

Increased interest in V/STOL aircraft has led to a renewed interest in propulsion systems for these aircraft and a need to examine and formulate military requirements. The influence of the aircraft installation on the design of propulsion systems is very significant and much study is required before aircraft development can be initiated. The influence of noise requirements on engine and aircraft designs is also commanding increasing attention not only because of the awareness by both civil and military authorities over problems affecting the environment we live in, but also from the economic point of view. The high cost of aircraft and engine development, and decreased military purchases encourage consideration of civil derivatives of aircraft and engines as a means of lowering the cost of ownership. The data base provided by V/STOL propulsion system component research and the technology base obtained by operating experience with V/STOL vehicles provides an insight to the future trend of V/STOL vehicles.

AD-776 998/7GA PC$7.50/MF$1.45
Borst (Henry V) and Associates Rosemont Pa
SUMMARY OF PROPELLER DESIGN PROCEDURES AND DATA. VOLUME III. HUB, ACTUATOR, AND CONTROL DESIGNS.
Final rept.,
Edward Sand, Douglas A. Elliott, Jr., and Henry V. Borst. Nov 73, 331p USAAMRDL-TR-73-34C
Contract DAAJ02-72-C-0033
See also Volume 2, AD-774 836.

Descriptors: *Vertical takeoff aircraft, *Propellers(Aerial), Short takeoff aircraft, Aerodynamics, Dual rotation propellers, Geometry, Optimization, Propeller blades.
Identifiers: *Design criteria.

The technology needed for the design and installation of propellers is presented and summarized in three volumes. Volume 3 (Hub, Actuator, and Control Design) contains material on the design of the hub and actuator systems. The theories of propeller controls are presented with the details of the types used with conventional and V/STOL airplanes. A brief discussion of past and future propeller installations is given along with recommendations for future work. Design criteria, airfoil data, and a computer program are given. (Author)

N74-16716/4GA PC$3.75/MF$1.45
General Electric Co., Pittsfield, Mass.
A TEST TECHNIQUE FOR MEASURING LIGHTNING-INDUCED VOLTAGES ON AIRCRAFT ELECTRICAL CIRCUITS.
Final Report.
L. C. Walko. Feb 74, 78p NASA-CR-2348, SRD-72-065
Contract NAS3-14836

Descriptors: *Aircraft equipment, *Electric arcs, *Electrical faults, *Electronic equipment, *Lightning, Electric current, Equipment specifications, Performance tests, Test equipment.

For abstract, see STAR 1208

N74-16718/0GA PC$5.00/MF$1.45
McDonnell-Douglas Corp., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME I: SUMMARY.
Final Report.
Feb 74, 157p NASA-CR-2353
Contract NAS2-6994

Descriptors: *Aircraft design, *Short takeoff aircraft, *Transport aircraft, Air traffic control, Airports, Feasibility analysis, Lift devices, Noise reduction.

For abstract, see STAR 1208

N74-16721/4GA PC$13.50/MF$1.45
Lockheed-California Co., Burbank. Rotary Wing Div.
EXPERIMENTAL HINGELESS ROTOR CHARACTERISTICS AT LOW ADVANCE RATIO WITH THRUST.
R. J. London, G. A. Watts, and G. J. Sissingh. Dec 73, 210p NASA-CR-114684
Contract NAS2-7245
Subm-Sponsored in Part by Army Air Mobility Research and Development Lab., Ames Directorate.

Descriptors: *Rigid rotors, *Rotary wings, *Rotor aerodynamics, *Wind tunnel tests, Aerodynamic configurations, Data acquisition, Performance tests.

For abstract, see STAR 1208

N74-16729/7GA PC$12.50/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash. Preliminary Design Dept.

ADVANCED SUBSONIC LONG-HAUL TRANSPORT TERMINAL AREA COMPATIBILITY STUDY. VOLUME 1: COMPATIBILITY ASSESSMENT.
Feb 74, 186p NASA-CR-132367, O6-22561-VOL-1
Contract NAS1-12018

Descriptors: *Aircraft design, *Airport planning, *Research projects, *Terminal facilities, *Transport aircraft, Aircraft configurations, Aircraft noise, Prediction analysis techniques, Technology utilization, Urban planning.

For abstract, see STAR 1208

N74-16730/9GA PC$11.00/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash. Preliminary Design Dept.
ADVANCED SUBSONIC LONG-HAUL TRANSPORT TERMINAL AREA COMPATIBILITY STUDY. VOLUME 2: RESEARCH AND TECHNOLOGY RECOMMENDATIONS.
Feb 74, 159p NASA-CR-132368, D6-22562-VOL-2
Contract NAS1-12018

Descriptors: *Aircraft design, *Airport planning, *Research projects, *Terminal facilities, *Transport aircraft, Aircraft configurations, Aircraft noise, Prediction analysis techniques, Technology utilization, Urban planning.

For abstract, see STAR 1208

N74-16732/1GA PC$4.00/MF$1.45
Centre d'Essai Aeronautique, Toulouse (France).
ENDURANCE TESTS ON TRANSPORT AIRCRAFT COCKPIT WINDOW GLASSES ESSAIS D'ENDURANCE SUR GLACES D'AVION DE TRANSPORT.
1973, 12p
Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *European airbus, *Fatigue tests, *Glass, *Windows (Apertures), Cockpits, Environment simulation, Laminates.

For abstract, see STAR 1208

N74-16733/9GA PC$4.00/MF$1.45
Aerospatiale Usines de Toulouse (France).
USE OF SIMULATION FOR THE DEVELOPMENT OF CONCORDE UTILISATION DE LA SIMULATION DANS LE DEVELOPPEMENT DE CONCORDE.
R. Deque, and J. Tardy. 5 Aug 73, 10p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Aircraft production, *Concorde aircraft, *Flight simulators, Analog simulation, Digital simulation.

For abstract, see STAR 1208

N74-16734/7GA PC$4.00/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
IN SITU NON-DESTRUCTIVE TESTING OF AIRCRAFT STRUCTURES BY HOLOGRAPHIC INTERFEROMETRY.
M. P. Wright. Feb 73, 13p RAE-TR-72218, BR33628

Descriptors: *Aircraft structures, *Holographic interferometry, *Nondestructive tests, Ailerons, Pulsed lasers, Ruby lasers, Structural analysis.

For abstract, see STAR 1208

N74-16735/4GA PC$6.00/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands). Div. Structures and Materials.
AN EVALUATION OF THE MISSION ANALYSIS CONCEPT FOR THE DEFINITION OF GUST DESIGN LOADS.
J. B. Dejonge. 10 Oct 72, 57p NLR-TR-72131-U
Subm-Sponsored by the Neth. Agency for Aerospace Programs.

Descriptors: *Aircraft design, *Gust loads, *Mission planning, Dc 8 aircraft, Failure analysis, Statistical analysis.

For abstract, see STAR 1208

N74-16736/2GA PC$5.25/MF$1.45
Royal Netherlands Aircraft Factories Fokker, Schiphol-Oost.
DESIGN FOR MAINTAINABILITY. AN INTRICATE SIMPLICITY.
J. Heyligers. 1973, 45p
Conf-Presented at the Danish Assoc. Of Aeron. Engineers Maintenance Symp., Copenhagen, 7 Nov. 1973.

Descriptors: *Aircraft design, *Aircraft maintenance, *Aircraft reliability, F-27 aircraft, Maintainability.

For abstract, see STAR 1208

N74-16737/0GA PC$4.25/MF$1.45
Technische Hogeschool, Delft (Netherlands). Dept. of Aeronautical Engineering.
COLUMN FAILURE OF THIN-WALLED COMPRESSION MEMBERS IN AIRCRAFT WINGS AS AFFECTED BY WALL IMPERFECTION AND CRUSHING.
A. Vanderneut. Jun 73, 22p VTH-175

Descriptors: *Columns (Supports), *Compression loads, *Structural failure, *Thin walls, *Thin wings, Bending, Buckling, Crushing, Stiffness.

For abstract, see STAR 1208

N74-16811/3GA PC$4.50/MF$1.45
Centre d'Essai Aeronautique, Toulouse (France).
ROLE OF COMPUTERIZED SIMULATION IN THE PERFECTING AERONAUTICAL EQUIPMENTS OR SYSTEMS CONTRIBUTIONS DE LA SIMULATION SUR CALCULATRICE A LA MISE AU POINT D'EQUIPEMENTS OU SYSTEMES AERONAUTIQUES.
Sep 73, 29p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Aeronautical engineering, *Air intakes, *Computerized simulation, *Hydraulic equipment, *Pumps, Air conditioning equipment, Analog simulation, Concorde aircraft.

For abstract, see STAR 1208

N74-17610/8GA PC$3.25/MF$1.45
Wisconsin Univ., Milwaukee.
SENSITIVITY ANALYSIS OF TORSIONAL VIBRATION CHARACTERISTICS OF HELICOPTER ROTOR BLADES. PART 1: STRUCTURAL DYNAMICS ANALYSIS.
T. Bratanow, and A. Ecer. Mar 74, 48p NASA-CR-2379
Contract NGR-50-007-001

Descriptors: *Dynamic structural analysis, *Rotary wings, *Torsional vibration, Boundary value problems, Dynamic response, Equations of motion, Finite element method, Stiffness.

For abstract, see STAR 1208

N74-17671/9GA PC$5.25/MF$1.45
National Aeronautical Lab., Bangalore (India).
CURRENT RESEARCH PROGRAMMES (1973).
Aug 73, 42p

Descriptors: *Aerospace sciences, *Research and development, Aerospace engineering, Instruments, Pilot plants, Propulsion system configurations.

For abstract, see STAR 1208

N74-17681/9GA PC$4.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
STUDY OF AN AEROSAT SYSTEM: EXAMPLE OF DIVISION OF LABOR ETUDE D'UN SYSTEME AEROSAT: EXEMPLE DE REPARTITION DU TRAVAIL.
C. Skenderoff. 1973, 15p
Subm-Sponsored by Esro. Conf-Presented at the 13TH European Space Symp., London, 25-27 Jun. 1973.
Language in French.

Descriptors: *Aerospace industry, *Contract management, *International cooperation, *Project planning, *Systems analysis, Air traffic control, Atlantic ocean, European space programs, Pacific ocean, Synchronous satellites.

For abstract, see STAR 1208

N74-17685/0GA PC$5.00/MF$1.45
Technische Hogeschool, Delft (Netherlands).
AVIATION NEEDS AND PUBLIC CONCERNS.
E. Vanlennep. 1973, 39p
Conf-Presented at 7TH Dr. Albert Plesman Memorial Lecture, Delft, Neth., 29 Oct. 1973.

Descriptors: *Aircraft noise, *Airport planning, *Civil aviation, *Fuel consumption, Aircraft fuels, Airline operations, Fuel oils, Noise reduction.

For abstract, see STAR 1208

1D. Aircraft Flight Control and Instrumentation

AD-776 345/1GA PC$3.00/MF$1.45
Army Aeromedical Research Lab Fort Rucker Ala
STATIC EVALUATION OF ABSOLUTE ALTIMETER DISPLAY DESIGNS - STUDY 1.
Thomas L. Frezell, Donald F. Harden, Paul D. Hunt, and Mark A. Hofmann. Feb 74, 10p Rept no. USAARL-74-9

Descriptors: *Altimeters, *Display systems, *Instrument dials, Ratings, Pilots, Students, Performance(Human), Analysis of variance, Flight instruments.
Identifiers: Evaluation, Dial design.

Six absolute altimeter display designs were evaluated in the static mode. Performance was measured with respect to subjects' reading accuracy, speed and preference. The subjects consisted of experienced Army aviators and non-flying college students. The results showed a significant difference between display types as well as between aviators and students. (Author)

PAT-APPL-392 376 PC$4.00/MF$1.45
Department of the Air Force Washington D C
BALANCE TYPE ANGLE OF ATTACK INDICATOR.
Patent Application,
R. W. Gallighton. Filed 28 Aug 73, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Angle of attack indicators, Patents, Flight instruments, Pitot tubes, Static pressure, Angle of attack.
Identifiers: *Patent applications, PAT-CL-73-205.

The invention relates to an angle of attack indicator for use as a cock pit instrument including movable elements which respond to the differences in pressure at selected points on the air-

craft. The pressure points include total pressure sensed by the aircraft pitot tube, atmospheric pressure sensed at aircraft static pressure port, and pressure sensed from at least one port on wing surface.

AD-164 494/7GA PC$4.00/MF$1.45
Department of the Air Force Washington D C
ROTARY ANGLE OF ATTACK INDICATOR.
Patent application,
R. W. Gallington. Filed 28 Aug 73, 11p Rept no. PAT-APPL-392 397
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Flight instruments, *Angle of attack indicators, Wings, Leading edges, Dynamic pressure, Back pressure, Airspeed.
Identifiers: *Patent applications, PAT-CL-73-205.

The invention relates to an angle of attack indicator for use as a cockpit instrument. It includes movable elements which respond to the differences in pressure at various points on the leading edge of the aircraft wing. The operation of the indicator is based on the principles that as the angle of attack of the wing is increased, the point of maximum pressure on the wing moves down around the leading edge thereof, and in the region of the point of maximum pressure, the pressure decreases as one moves away from the point of maximum pressure.

1E. Air Facilities

AD-776 331/1GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
ENGINEER DESIGN TEST OF HEAVY-DUTY MEMBRANE AIRFIELD SURFACING.
Final rept. May 70-May 72,
Frank M. Palmer. Feb 74, 94p Rept no. AEWES-TR-S-74-2

Descriptors: *Pavements, *Landing fields, *Membranes, Runways, Waterproofing, Dust control, Performance(Engineering), Surfaces, Transport aircraft.
Identifiers: C-130 aircraft.

Tests were conducted to determine the suitability of heavy-duty airfield surfacing and accessories as expedient membrane surfacing for waterproofing and dustproofing hastily prepared airfields for operations of C-130 aircraft. The objectives of the tests were to compare the heavy-duty membrane with the WX18 membrane, and to determine through laboratory and field tests whether the heavy-duty membrane met the requirements of the Department of the Army approved Qualitative Materiel Requirement (QMR) for Prefabricated Airfield Surfacings. (Modified author abstract)

AD-776 761/9GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
EVALUATION OF RUNWAY SKID-RESISTANCE CHARACTERISTICS AT ELLSWORTH AFB, SOUTH DAKOTA.
Final rept. Oct 72-Jun 73,
George D. Ballentine, and Phil V. Compton. Mar 74, 49p Rept no. AFWL-TR-74-8

Descriptors: *Pavements, *Runways, *Skidding, Military facilities, Drainage, Performance(Engineering), Test methods, Surfaces, Friction, Coverings, Acceptability, South Dakota.
Identifiers: Ellsworth Air Force Base, Hydroplaning.

Data gathered during the Air Force Weapons Laboratory standard skid-resistance test conducted at Ellsworth AFB, South Dakota, on 21 October 1972 are analyzed. The test results indicate the runway surface had only fair skid-resistance properties and decidedly poor drainage characteristics. The report recommends an overlay be constructed on the runway to correct the drainage problem, followed by a porous friction surface to improve skid-resistance properties. (Author)

PB-230 355/0GA PC$4.75/MF$1.45
Metropolitan Transportation Commission, Berkeley, Calif.
AIRPORT ACCESSIBILITY IN THE SAN FRANCISCO BAY AREA. A STUDY OF ITS FUNCTION AND ROLE IN THE REGIONAL TRANSPORTATION PLAN. VOLUME I.
Final rept.,
Arthur J. Negrette, and Chris Brittle. 11 Jan 74, 134p MTC-AP-74-01
See also Volume 2, PB-230 356.

Descriptors: *Airports, *Regional planning, *Air transportation, *California, Bays(Topographic features), Rapid transit railways, Surveys, Travel.

The purpose of the Airport Access Study is to present findings and recommendations relating to the ability of regional ground transportation systems to serve future aviation demand at the major commercial air transportation centers in the San Francisco Bay Area. The report provides an historical persepective of factors influencing air travel and analyzes existing ground transportation systems to determine their capacity and degree of utilization. An inventory of airport access services other than the private automobile is also presented.

2. AGRICULTURE

2C. Agricultural Engineering

PB-229 663-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
A PLOW BODY FOR STICKY SOILS (KORPUS DLYA VSPASHKI LIPKIKH POCHV),
A. I. Miltsev. 30 Jan 74, 3p NTML-WRC-368
Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Selskogo Khozyaistva (USSR) n1 p40 1970, by William R. Gill.

Descriptors: *Plows, *Soil machine relations, Adhesion, Polyethylene, Cultivation, Loads(Forces), Soil water, Deformation, Translations, USSR.

Low density polyethylene was used to cover the moldboard of a plow to reduce sticking in wet soils. The plastic cover improved the degree of soil breakup, and had a lower specific resistance - .66 kg per sq. cm. vs .72 kg per sq. cm. The plow covered with plastic clogged less and required less fuel.

PB-229 664-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
THE USE OF METHODS OF THEORY OF DIMENSIONAL ANALYSIS FOR THE EVALUATION OF THE DRAFT CHARACTEISTICS OF THE PLOW DURING OPERATION IN DIFFERENT CONDITIONS (O PRIMENIMOSTI METODOV TEORII RAZMERNOSTEI K OTSENKE TYAGOVYKH PO KAZATELEI PLUGA PRI RABOTE V RAZLICHNYKH USLOVIYAKH),
E. N. Krastin. 5 Feb 74, 9p NTML-WRG-369
Trans. of Institut Inzhenerov Selskokhozyaistvennogo Proizvodstva. Doklady (USSR) v8 n1 p61-66 1973, by William R. Gill.

Descriptors: *Plows, *Cultivation, *Soil machine interactions, Loads(Forces), Dimensional analysis, Translations, Velocity measurement, USSR.

The principles of similitude were applied to the study of plow draft. A graphic function was developed for plows with a constant width-depth ratio, which makes it possible to predict draft resistance in a wide range of production conditions.

PB-229 766-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
THE MECHANICS OF FORMATION AND PARAMETER OF THE ZONE OF VOLUME COMPRESSION IN SOIL WORKING PROCESSES (O MEKHANIKE OBRAZOVANIYA I PARAMETRAKH ZONY OBEMNOGO SUTATIYA VA PROTSESSAKH OBRABOTKI POCHVY),
Yu. F. Nivikov, N. A. Sokol, and L. L. Yakushchenko. 7 Mar 74, 8p NTML-WRG-376
Trans. of Vsesoyuznaya Akademiya Selskokhozyaistvennykh Nauk. Doklady (USSR) n5 p41-44 1971, by William R. Gill.

Descriptors: *Agricultural machinery, *Soil compacting, *Soil machine relations, Cultivation, Soil dynamics, Cutting, Translations, USSR.

A study was made of soil compaction in front of an inclined tillage tool. The wave of volume compaction in front of the tool was determined by X rays. Density of the X-ray film was correlated with the density of test soil samples. The limit of the compression zone was 100-145 mm from the working surface of the tool.

PB-229 767-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
DETERMINATION OF THE COEFFICIENT OF RESISTANCE TO ROLLING OF RIGID WHEELS WITH LUGS DURING MOVEMENT ON COMPACTED SOIL (OPREDELENIE KOEFFITSIENTA SOPROTIVLENIYA KACHENYU ZHESTOGO KOLECA C GRUNTO-ZATSEPAMI PRI DVIZHENII PO SMINAEMOMY GRUNTU),
N. A. Zabavnikov, P. S. Sologub, B. L. Nazarenko, V. N. Navmov, and Yu. L. Rozhdestvenski. 26 Feb 74, 10p NTML-WRG-373
Trans. of Traktory i Selkhozmashiny (USSR) n1 p16-19 1973, by William R. Gill.

Descriptors: *Wheels, *Agricultural machinery, *Soil machine relations, Soil compacting, Soil-machine interactions, Traction, Lugs, Torque, Translations, USSR.

An analysis was made of the coefficients of rolling resistance with rigid lugged wheels on firm soil. An equation is presented to describe the rolling resistance for the three possible cases: free rolling, towed, and powered wheels.

PB-229 768-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
THE EFFECTIVENESS OF A BULLDOZER MOLDBOARD WITH A PROTRUDING CENTER OF THE BLADE (EFFEKTIVNOST BULDOZERNOGO OTVALA C VYSTUPAYUSHCHIM SREDNIM NOZHOM),
V. I. Balovnev, V. Ya. Dvorkov, F. I. Zainetdinov, V. A. Tarkhanov, and V. S. Berezin. 7 Mar 74, 7p NTML-WRG-372
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) n10 p8-9 1972, by William R. Gill.

Descriptors: *Bulldozers, *Agricultural machinery, *Soil machine relations, Earthwork, Loads(Forces), Effectiveness, Design, Cutting, Translations, Blades, USSR.

Studies were made of bulldozer blades with protruding centers. Blade productivity was increased 20-40% when working in strong soils. The width of the blade extension was optimized in relation to the width of the bulldozer blade.

PB-229 769-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
STATISTICAL EVALUATION OF THE DRAFT RESISTANCE OF SOIL WORKING MACHINES (STATISTICHESKIE OTSENKI TYAGOVOGO SOPROTIVLENIYA POCHVOOBRABATYVAYUSHCHIKH MASHIN),
A. B. Lure. 12 Feb 74, 14p NTML-WRG-371
Trans. of Mekhanizatsiya i Elecktrifikatsiya Sotsialisticheskogo Selskogo Khozyaistva (USSR) n10 p50-52 1972, by William R. Gill.

Descriptors: *Agricultural machinery, *Soil machine relations, Loads(Forces), Cultivation, Plows, Design, Translations, USSR.

The draft values of soil working machines were examined by statistical processes. The spectral density of the draft component and the spectral density of the soil resistance had the highest values at a frequency 5-6 per/sec or less. Depth had little influence on this value.

PB-229 774-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
THE TESTS OF AN IMPROVED METHOD OF TRACTIVE TESTING OF TRACTORS WITH THE USE OF THE THEORY OF SIMILITUDE AND DIMENSIONAL ANALYSIS (OPYT COVERSHENSTOVOVANIYA METODIKI TYAGOVYKH ISPYTANII TRACTOROV C PRIMENENIEM TEORII PDOBIYA I RAZMERNOSTEI),
N. M. Sharov, E. N. Drastin, A. P. Bannik, and V. S. Safronov. 12 Mar 74, 8p NTML-WRG-379
Trans. of Traktory i Selkhozmashiny (USSR) n6 p9-11 1973, by William R. Gill.

Descriptors: *Tractors, *Agricultural machinery, *Soil machine interactions, Test methods, Dimensional analysis, Traction, Soil properties, Translations, USSR.

A method is described to apply the theories of similitude and dimensional analysis in an attempt to secure a functional relation between parameters characterizing soil conditions and the traction possibilities of a tractor.

PB-229 775-T/GA PC$4.00/MF$1.45
National Tillage Machinery Lab., Auburn, Ala.
THE DRIVE OF SOIL ROTARY TILLERS (O PRIVODE POCHVOOBRABATYVAYUSHIKH FREZ),
V. P. Tarasov, and V. F. Strelbitskii. 11 Mar 74, 5p NTML-WRG-377
Trans. of Traktory i Selkhozmashiny (USSR) n1 p24-25 1973, by William R. Gill.

Descriptors: *Plows, *Soil machine relations, Design, Cultivation, Deformation, Translations, Rotation, USSR.

A rotary tiller is described which uses a central drive. The design eliminates the need for one gear reducer. A forward directed screw-type rotor provides ground clearance in front of the central gear box. The thrust provided by the screw helps to propel the unit.

2D. Agronomy and Horticulture

AD-776 550/6GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
DYNAMICS OF RESIDUES OF SEVIN, PHTHALOPOS, AND PHOSALONE IN CABBAGE LEAVES,
L. P. Bocharova. 3 Dec 73, 8p Rept no. FSTC-HT-23-2092-72
Trans. of Primen. Pestits., Sel. Khoz., Mater. Nauch. Konf. 1969 (Pub 1970) pp113-118 (sic).

Descriptors: *Vegetables, *Insecticides, Plant tissue, Residues, Plant(Botany), Growth(General), Test methods, Atmospheric precipitation, Atmospheric temperature, Translations, USSR.
Identifiers: *Cabbage plants, Carbaryl, Phosalone, Phosphorodithioates, Phthalophos.

In experiments conducted in 1968 the report reveals the influence of atmospheric precipitation on the rate at which Sevin, phthalophos and phosalone - DDT replacements were being introduced into agricultural practice for cabbage plants. Studies of the dynamics of the specified preparations' residues on cabbage of the early No. 1 variety are made. The translation gives results of these tests.

AD-776 566/2GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
AFTER EFFECTS OF HERBICIDES,
A. B. Soldatov. 3 Dec 73, 4p Rept no. FSTC-HT-23-2091-72
Trans. of Belorusskaya Selskokhozyaistvennaya Akademiya. Trudy (USSR) n62 p127-128 1970.

Descriptors: *Herbicides, *Toxicity, Soils, Cereals, Farm crops, Dosage, Tolerances(Physiology), Vegetation, Control, Translations, USSR.
Identifiers: *Weed control.

Herbicides are irreplaceable in liquidating primary foci of contamination and in destroying weeds remaining after measures have been taken using crop rotation and corresponding treatment of the soil. In connection with some herbicides' prolonged toxic effect in the soil it is necessary to know their aftereffects on subsequent crops sown in the second year after given preparations are employed. The translation discusses these aftereffects.

AD-776 895/5GA PC$4.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
FEASIBILITY OF ESTABLISHMENT OF VEGETATION FOR CAMOUFLAGE THROUGH HYDROPLANTING TECHNIQUES.
Final rept.,
J. Ray Frank, and William C. LeCroy. Jan 74, 94p Rept no. LWL-TR-31B73

Descriptors: *Vegetation, *Camouflage, Grasses, Plants(Botany), Soils, Laboratory tests, Experimental data, Growth(General), Photographs, Military operations.
Identifiers: Evaluation, *Hydroplanting, Feasibility.

A greenhouse and field test program was conducted by the Vegetation Control Division at Fort Detrick, March - September 1973, to evaluate the feasibility of establishment of vegetation cover as camouflage on disturbed soil areas by hydroplanting techniques. A need exists for a camouflage technique which will provide rapid establishment of vegetation cover on spoiled surfaces in missile sites, base camp perimeters and other military installations. The feasibility study showed that vegetation covers, consisting principally of grasses, could be established rapidly by hydroplanting and provide stands comparable in density to those established by other cultural methods. Limited aerial photographic imagery with Ektachrome and Infrared Ektachrome film indicated that the hydroplanted vegetation covers compared favorably with established vegetation in camouflage characteristics. (Modified author abstract)

E74-10362 PC$6.25/MF$1.45
Kansas Univ./Center for Research, Inc., Lawrence. Remote Sensing Lab.
KANSAS ENVIRONMENTAL AND RESOURCE STUDY: A GREAT PLAINS MODEL. EXTRACTION OF AGRICULTURAL STATISTICS FROM ERTS-1 DATA OF KANSAS.
Final rept. 1 Aug 72-12 Feb 74,
S. A. Morain, and Donald Williams. 12 Feb 74, 61p NASA-CR-137047
Contract NAS5-21822
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198.

Descriptors: Crop identification, Land use, Kansas, Wheat, Earth resources program, Agriculture, Mathematical models, Weather.

The author has identified the following significant results. Wheat area, yield, and production statistics as derived from satellite image analysis, combined with a weather model, are presented for a ten county area in southwest Kansas. The data (representing the 1972-73 crop year) are compared for accuracy against both the USDA August estimate and its final (official) tabulation. The area estimates from imagery for both dryland and irrigated winter wheat were within 5% of the official figures for the same area, and predated them by almost one year. Yield on dryland wheat was estimated by the Thompson weather model to within 0.1% of the observed yield. A combined irrigated and dryland wheat production estimate for the ten county area was completed in July, 1973 and was within 1% of the production reported by USDA in February, 1974.

E74-10367 PC$4.25/MF$1.45
Iowa Agricultural Experiment Station, Ames.
REMOTE SENSING IN IOWA AGRICULTURE: IDENTIFICATION AND CLASSIFICATION OF IOWA'S CROPS, SOILS AND FORESTRY RESOURCES USING ERTS-1 AND COMPLIMENTARY UNDERFLIGHT IMAGERY.
Progress rept.,
J. P. Mahlstede, R. E. Carlson, T. E. Fenton, and G. W. Thomson. 28 Feb 74, 22p NASA-CR-137061
Contract NAS5-21839
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198.

Descriptors: Crop identification, Timber inventory, Iowa, Soil mapping, Earth resources program, Multispectral photography, Land use, Vegetation, Agriculture.

The author has identified the following significant results. Springtime ERTS-1 imagery covering preselected test sites in Iowa showed considerable detail with respect to broad soil and land use patterns. Additional imagery has been incorporated into a state mosaic. The mosaic was used as a base for soil association lines transferred from an existing map. The regions of greatest contrast are between the Clarion-Nicollet-Webster soil association area and adjacent areas. Landscape characteristics in this area result in land use patterns with a high percentage of pasture, hay, and timber. The soil association areas of the state that have patterns interpreted to be associated with intensive row crop production are: Moody, Galva-Primghar-Sac, Clarion-Nicollet-Webster, Tama-Muscatine, Dinsdale-Tama, Cresco-Lourdes, Clyde, Kenyon-Floyd-Clyde, and the Luton-Onawa-Salix area on the Missouri River floodplain. Forestland estimates have been attained for an area in central Iowa using wintertime ERTS-1 imagery. Visual analysis of multispectral, temporal imagery indicates that temporal analysis for cropland identification and acreage analyses procedures may be a very useful tool. Combinations of wintertime, springtime, and summertime ERTS-1 imagery separate most vegetation types. Timing can be critical depending upon crop development and harvesting times because of the dynamic nature of agricultural production.

PAT-APPL-351 934 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
CONTROL OF AESCHYNOMENE SP. WITH COLLETOTRICHUM GLOEOSPORIOIDES PENZ. F. SP. AESCHYNOMENE.
Patent Application,
James T. Daniel, George E. Templeton, and Roy J. Smith, Jr. Filed 17 Apr 73, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Weed control, *Plant diseases, *Patent applications, Leguminous plants, Fungus diseases, Plant pathology, Effectiveness, Spores, Rice plants, Inland waterways, Arkansas.
Identifiers: PAT-CL-424-93, *Aeschynomene virgubuca, Colletotrichum gloesporioides.

The invention relates to a method for controlling northern jointvetch. More particularly, this invention relates to a method for controlling northern jointvetch with an endemic anthracnose disease of

northern jointvetch, Aeschynomene virgubuca, incited by the fungus Colletotrichum gloesporioides.

PB-229 835/4GA PC$4.50/MF$1.45
Montana Agricultural Experiment Station, Bozeman.
DRYLAND SODDING WITH NATIVE GRASSES FOR PERMANENT EROSION CONTROL.
Interim rept.,
Brian W. Sindelar. 20 Oct 72, 27p RR-43
Report on 'Procedures and Materials for Roadside Development in Montana.'

Descriptors: *Turf grasses, *Roads, *Erosion control, Soil erosion, Semiarid land, Damage, Soil stabilization, Effectiveness, Montana.
Identifiers: Dryland sodding.

A new adaptation of grass sodding was tested by the Montana Agricultural Experiment Station during the fall of 1971 and the 1972 growing season. Termed 'dryland sodding', the technique involves use of native rhizomatous grasses which are sodded without the artificial application of water during or following the sodding procedure. Relatively low installation costs, low maintenance costs, expected permanence, and greater aesthetic values suggest that dryland sodding has considerable potential for providing natural erosion control on severe dryland sites.

2E. Animal Husbandry

AD-776 525/8GA Reprint
Armed Forces Inst of Pathology Washington D C
ISOLATION OF TYPE-A INFLUENZA VIRUSES FROM IMPORTED EXOTIC BIRDS,
Richard D. Slemons, Ralph S. Cooper, and John S. Orsborn. 14 May 73, 8p
Presented at the Annual Meeting (110th), American Veterinary Medical Association, Philadelphia, Pa., 16-19 Jul 73.
Availability: Pub. in Avian Diseases, v17 n4 p746-751 Oct-Dec 73.

Descriptors: *Influenza virus, *Birds, Virus diseases, Viruses, Isolation, Identification, Antigens.
Identifiers: *Animal diseases, Hemagglutination inhibition test, Influenza type A virus.

From 1 January 1972 to 22 July 1972, 15 type-A influenza viruses were identified from 15 cases involving 12 different species of exotic birds being imported into southern California from outside the United States and some that had already been distributed to several locations there. The type-specific antigen (ribonucleoprotein) was identified by the agar-gel-diffusion test, and tentative identification of one strain-specific antigen (hemagglutinin) was made by the hemagglutination-inhibition test. (Modified author abstract)

AD-776 624/9GA Reprint
Armed Forces Inst of Pathology Washington D C
TERATOMA IN DOMESTIC FOWL (GALLUS GALLUS) - CASE REPORT,
C. F. Helmboldt, G. Migaki, K. A. Langheinrich, and R. M. Jakowski. 15 Oct 73, 8p
Availability: Pub. in Avian Diseases, v18 n1 p142-148 Jan/Mar 74.

Descriptors: *Neoplasms, *Ovaries, Chickens, Tissues(Biology), Pathology, Histological techniques.
Identifiers: *Teratoma, Gallus gallus.

Teratomas are defined as tumors of multiple tissue origin. Spontaneous teratomas in chickens are considered rare, and only 36 cases have been reported. The report concerns the histopathologic findings of teratoma in two roosters.

2F. Forestry

PB-229 822/2GA PC$4.75/MF$1.45
Agency for International Development, Washington, D.C. Office of Science and Technology.
UTILIZATION OF TROPICAL FORESTS. (A REVIEW OF THE FORESTRY LITERATURE IN THE AGENCY FOR INTERNATIONAL DEVELOPMENT REFERENCE CENTER),
Edward P. Cliff. Nov 73, 31p TA/OST-73-20 AID-ARC-634.98072-C637

Descriptors: *Forestry, *Developing countries, *Reviews, Forest industry, Utilization characteristics, Land use, Trees, Problem solving, Recommendations, Reforestation, Project planning, Improvement, Economic development, Tropical woods, Africa, Latin America, Asia.

A review is made of forestry reports, publications, and other documents in the A.I.D. Reference Center to determine information available on utilization problems of secondary tree species in the developing countries. The time span covered is 27 years beginning in 1946. The report identifies forestry and land use problems, and examines recommended measures to upgrade forestry programs and improve utilization of unused and little used species.

PB-230 738/7GA PC$4.75/MF$1.45
Forest Service, Washington, D.C.
FACTORS INFLUENCING THE UTILIZATION OF TROPICAL WOOD SPECIES.
Final rept.,
Alan D. Freas, Martin Chudnoff, Robert C. Koeppen, and S. Blair Hutchison. Nov 73, 34p TA/OST-73-22, AID-ARC-634.9-F849
Grant PASA-TA(AJ)-2-73

Descriptors: *Tropical woods, Utilization, Constraints, Reviews, Factor analysis, Economic development, Developing countries.

A.I.D. has been concerned, for an extended period of time, over the deleterious practice, in many tropical countries, of concentrating on a relatively limited number of species of tropical woods for exploitation. This investigative report, through review of available literature and on-the-ground consultation in selected countries, attempts to determine whether lack of knowledge of secondary species characteristics is the primary deterrent to their increased use, or whether there are other equally and perhaps more important factors to be considered.

3. ASTRONOMY AND ASTROPHYSICS

3B. Astrophysics

AD-776 453/3GA Reprint
California Univ Berkeley Dept of Physics
THE METHANOL SOURCE IN ORION AT 1.2 CENTIMETERS,
M. F. Chui, A. C. Cheung, D. Matsakis, C. H. Townes, and A. G. Cardiasmenos. 5 Nov 73, 3p
Contract N00014-69-A-0200-1003, Grant NSF-GP-30424
Prepared in cooperation with Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering, Grant NSF-GP-38593.
Availability: Pub. in The Astrophysical Jnl., v187 pL19-L21.

Descriptors: *Interstellar matter, *Carbinols, Emission spectra, Extraterrestrial radio waves.
Identifiers: Orion nebula, NGC 1976 nebula.

Methanol line radiation from Orion near 25 GHz has been reexamined and found to be much stronger than expected from earlier reports. The line widths are also narrower than other nonmasing molecular radiation. These results indicate either that there is more than one small source of methanol radiation in Orion, or that these transitions are inverted and varying with time. (Author)

AD-776 628/7GA PC$3.75/MF$1.45
Iowa Univ Iowa City Dept of Physics and Astronomy
THE EARTH AS A RADIO SOURCE: TERRESTRIAL KILOMETRIC RADIATION.
Progress rept.,
Donald A. Gurnett. Feb 74, 55p Rept no. U. of Iowa-74-11
Contracts N00014-68-A-0196-0003, NAS5-11074
Sponsored in part by Contract NAS5-11431 and Grant NGL-16-001-043.

Descriptors: *Earth(Planet), *Radio waves, Radio sources(Astronomy), Aurorae, Power, Intensity, Scientific satellites.
Identifiers: IMP-6 satellite, IMP-8 satellite, Terrestrial radiation.

Radio wave experiments on the IMP-6 and 8 satellites have shown that the earth emits very intense electromagnetic radiation in the frequency range from about 50 kHz to 500 kHz. A peak intensity the total power emitted in this frequency range is about 1 billion watts. The earth is, therefore, a very intense planetary radio source, with a total power output comparable to the decametric radio emission from Jupiter. This radio emission from the earth is referred to as terrestrial kilometric radiation. Terrestrial kilometric radiation appears to originate from low altitudes (less than 3.0Re) in the auroral region. Possible mechanisms which can explain the generation and propagation of the terrestrial kilometric radiation are discussed. (Modified author abstract)

BMBW-FB-W-72-27 PC$5.45/MF$1.45
Zentralstelle fuer Luft- und Raumfahrtdokumentation und -Information, Muenchen (F.R. Germany).
SOLAR OBSERVATIONS AND RESEARCH WITH ROCKETS.
G. Schmidtke. Aug 72, 124p
In German. U.S. Sales Only.

Descriptors: (*Solar activity, *Research programs), (*Solar radiation, Research programs), Rockets, Satellites, Ultraviolet radiation, X radiation.

For abstract, see NSA 29 07, number 16567.

COM-74-50233/7GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
GALACTIC COSMIC RAY MODULATION IN THE OUTER SOLAR SYSTEM: SOLAR WIND CONSEQUENCES.
Technical rept.,
S. T. Suess, L. A. Fisk, and T. E. Holzer. Nov 73, 17p NOAA-TR-ERL-285, SEL-26 NOAA-74021906
Paper copy available from GPO $0.55 as C55.13:ERL 285-SEL 26.

Descriptors: *Galactic cosmic rays, *Solar wind, Modulation, Momentum transfer, Magnetic fields.
Identifiers: Interplanetary magnetic fields.

It has recently been suggested that 'quite-time electron increases' may be indicative of a galactic cosmic ray modulation region in the outer solar system that is quite distinct from the modulation region in the inner solar system. The effects of an outer modulation region on the solar wind expansion is considered. It was found that the effects are somewhat more important than those associated with only an inner modulation region, when the same constraints on galactic cosmic ray energy density are applied. It was also found that the existence of an outer modulation region will not lead to a shock-free solar wind transition to subsonic flow (or even to a weakly shocked transition) in the absence of an interstellar neutral gas, and that

the cosmic ray effects are less important than those of the neutral gas in the presence of an interstellar atomic hydrogen gas of density 0.1/cc. (Author)

N74-16889/9GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
LUNAR RADIO EMISSION IN THE 1.35 TO 2.5 CM BAND.
V. M. Plechkov. Feb 74, 6p NASA-TT-F-14755
Contract NASW-2485
Tran-Transl. Into English from the Publ. "Fizika Luny I Planet" Moscow, Nauka, 1972 p 104-106.

Descriptors: *Electromagnetic absorption, *Lunar temperature, *Radio emission, *Wavelengths, Absorptivity, Dielectrics, Harmonics, Lunar soil.

For abstract, see STAR 1208

N74-16890/7GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
ANALYSIS OF RADIO WAVE PROPAGATION IN THE VENUSIAN ATMOSPHERE.
O. I. Yakovlev. Feb 74, 8p NASA-TT-F-14756
Contract NASW-2485
Tran-Transl. Into English from the Publ. "Fizika Luny I Planet" Moscow, Nuka, 1972 p 372-374.

Descriptors: *Radio waves, *Venus atmosphere, *Wave propagation, Absorption spectra, Atmospheric refraction, Atmospheric turbulence, Electromagnetic wave transmission.

For abstract, see STAR 1208

N74-17525/8GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SOLAR COSMIC RAY COMPOSITION ABOVE 10 MEV/NUCLEON AND ITS ENERGY DEPENDENCE IN THE 4 AUGUST 1972 EVENT.
D. L. Bertsch, S. Biswas, and D. V. Reames. Jan 74, 31p NASA-TM-X-70590, X-662-74-32
Subm-Submitted for Publication.

Descriptors: *Radiant flux density, *Solar cosmic rays, Charged particles, Energy distribution, Helium, Iron compounds, Protons.

For abstract, see STAR 1208

N74-17543/1GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GALACTIC ARM STRUCTURE AND GAMMA RAY ASTRONOMY.
G. F. Bignami, and C. E. Fichtel. Jan 74, 14p
NASA-TM-X-70589, X-662-74-31
Subm-Submitted for Publication.

Descriptors: *Astrophysics, *Galactic structure, *Gamma rays, Flux density, Galactic structure, Magnetic domains, Magnetic fields, Spectral energy distribution.

For abstract, see STAR 1208

N74-17544/9GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MILLISECOND TEMPORAL STRUCTURE IN CYG X-1.
R. E. Rothschild, E. A. Boldt, S. S. Holt, and P. J. Serlemitsos. Dec 73, 13p NASA-TM-X-70583, X-661-73-393
Subm-Submitted for Publication.

Descriptors: *Binary stars, *Stellar structure, Black holes (Astronomy), Radio bursts, X ray analysis.

For abstract, see STAR 1208

N74-17545/6GA PC$4.75/MF$1.45
Groupe de Recherches de Geodesie Spatiale, Paris (France).
BULLETIN OF THE GROUPE DE RECHERCHES DE GEODESIE SPATIALE, NO. 9BULLE N DU GROUPE DE RECHERCHES DE GEODESIE SPATIALE, NO. 9.
Jul 73, 53p GRGS-BULL-9
In French; English Summaries.

Descriptors: *Antares rocket vehicle, *Baker-nunn camera, *Doppler effect, *Geodetic coordinates, Earth axis, Imaging techniques, Satellite tracking, Star distribution.

For abstract, see STAR 1208

N74-17550/6GA PC$4.00/MF$1.45
Mons Univ. (Belgium). Dept. d'Astrophysique.
RESEARCH ACTIVITIES OF THE DEPARTMENT OF ASTROPHYSICS.
Annual Report, 1972.
L. Houziaux. 1973, 19p COMMUN-36

Descriptors: *Astrophysics, *Belgium, Astronomical catalogs, Early stars, Stellar atmospheres.

For abstract, see STAR 1208

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-776 321/2GA PC$7.75/MF$1.45
Naval Postgraduate School Monterey Calif
INITIALIZATION OF A 5-LEVEL GLOBAL ATMOSPHERIC GENERAL CIRCULATION MODEL USING A STAGGERED, SPHERICAL, SIGMA COORDINATE SYSTEM.
Master's thesis,
James Michael McCollough. Mar 74, 95p

Descriptors: *Atmospheric circulation, Mathematical models, Wind, Barometric pressure, Partial differential equations, Weather forecasting, Theses, Computer programs.
Identifiers: Numerical weather forecasting, Primitive equations.

Initialization of a five-level global baroclinic primitive equation model was examined using real data. Experiments were conducted using a Robert (1965) time frequency filter, Euler backward time integration, and an iterative initialization scheme to determine the effect of each on the generation of inertial-gravity waves resulting from an improper balance between initial mass and wind fields. In addition, a global sigma-surface linear balance equation solution was examined for the purpose of determining initial winds. Although all forecast fields were meteorological, certain undesirable features were generated in the polar and equatorial regions. (Author)

AD-776 329/9GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
TURBULENT HEATING OF AN ATMOSPHERE BY A LASER BEAM.
Research and development technical rept.,
Edward Collett, and Chan Mou Tchen. Feb 74, 32p
Rept no. ECOM-5519
Also available as Atmospheric Sciences Research Paper no. 72.

Descriptors: *Atmospheres, *Heating, *Laser beams, Turbulence, Atmospheric motion, Heat flux, Eddy currents.
Identifiers: *Laser heating.

A dynamical theory for the heating of a turbulent medium by a high energy laser is developed. Considered as a heat source, the laser beam is given as a known function of time, position, and of the turbulent state of the medium. The equation of turbulent heating is formulated by investigating the correlation between the fluctuations in velocity, temperature, and the electric field. Based upon Tchen's cascade theory of turbulence, and expression for the eddy conductivity is obtained and represents the contribution by eddies of smaller scales then the mean width of the variable temperature profile. The time evolution of the temperature profile is determined, including the special cases of laser pulses of infinitesimal and finite durations and a cw laser beam. The analysis shows that the effect of turbulence is to increase the standard deviation (or thermal spread) of the mean temperature profile, and thereby decrease the temperature near the beam width. The time and space evolutions of heat conduction are shown to be convertible. (Author)

AD-776 459/0GA Reprint
Chicago Univ Ill Dept of the Geophysical Sciences
MICROSCALE ORDERED MOTIONS AND ATMOSPHERIC STRUCTURE ASSOCIATED WITH THIN ECHO LAYERS IN STABLY STRATIFIED ZONES.
Doctoral thesis,
James I. Metcalf, and David Atlas. 8 Aug 72, 31p
AROD-9745.3-EN
Grant DA-ARO-D-31-124-71-G71
Supersedes AD-749 512.
Availability: Pub. in Boundary-Layer Meteorology, v4 p7-35 1973.

Descriptors: *Clear air turbulence, *Radar cross sections, Atmospheric sounding, Atmospheric temperature, Wind, Power spectra, Theses.

The interpretation of ultra-high resolution radar observations of thin clear-air echo strata is made with the aid of fine-scale aircraft measurements. The echo layer, generally comprising two substrata each 5 m thick and spaced 7-10 m apart, is found within a 10-20 m deep section of a strong inversion where the thermal stability and shear are maximized, and the Richardson number is close to 0.25. Two possible sources of the echoes are proposed: (1) scatter from fully developed turbulence within the interfacial zone in an inertial subrange falling entirely in sub-meter scales; and (2) the incoherent summation of specular reflections from properly oriented portions of the microscale K-H ripples. While the authors favor the first of these mechanisms, both require stringent conditions of the physical microstructure which are beyond the available observations. Fossil turbulence is precluded as an echo mechanism. (Modified author abstract)

AD-776 464/0GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
UPPER AIR WIND SPEEDS CALCULATED FROM OBSERVATIONS OF NATURAL INFRASOUND,
David Rind, William L. Donn, and Ellen Dede. 9 Jul 73, 5p Rept no. LDGO-2011 AROD-6997.28-EN
Grant DA-ARO-D-31-124-71-G90
Prepared in cooperation with City Coll., New York. Inst. of Oceanography. Revision or report dated 26 Jan 73.
Availability: Pub. in Jnl. of Atmospheric Sciences, v30 n8 p1726-1729 Nov 73.

Descriptors: *Upper atmosphere, *Wind velocity, Microbarometric waves, Infrasonics, Acoustic detection.

In a continuing study of the feasibility of using microbarom (natural infrasound) observations to define characteristics of upper air winds, the authors determined the seasonal mean trace velocity of microbaroms. It is shown that this is equal to the acoustic velocity at an upper reflection level. This velocity is the sum of the sound speed based on temperature alone and the wind speed. The former is determined from the vertical temperature profile. One may thus calculate the wind speed at particular reflection levels in the stratosphere and ionosphere. Results compare

well with direct observations. (Modified author abstract)

AD-776 499/6GA Reprint
State Univ of New York Albany Dept of Atmospheric Science
POSITIVE STREAMER SYSTEM INTENSIFICATION AND ITS POSSIBLE ROLE IN LIGHTNING INITIATION,
C. T. Phelps. 6 Feb 73, 11p AROD-9041.4-EN
Grant DA-ARO-D-31-124-72-G140
Availability: Pub. in Jnl. of Atmospheric and Terrestrial Physics, v36 n103-111 1974.

Descriptors: *Atmospheric electricity, *Atmospheric physics, *Lightning, Electric discharges, Experimental design.

Experiments are described in which positive streamers propagate within a uniform field region having an applied electric field greater than the minimum value needed to cause streamers to bridge the interelectrode gap. Under these conditions exponential intensification of the streamer system is observed, accompanied by negative charge deposition along the channels. These results are shown to be a direct consequence of energy and charge conservation for the streamer system when individual streamers are treated as isolated propagating space charge pulses. The formation of a stepped leader via this process is discussed. (Author)

AD-776 509/2GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INFLUENCE OF A CHANGE IN HUMIDITY ON THE OPTICAL AND MICROPHYSICAL PROPERTIES OF AN ATMOSPHERIC AEROSOL,
L. S. Ivlev, N. K. Spazhakina, N. O. Grigorov, and E. L. Yanchenko. 27 Dec 73, 15p Rept no. FSTC-HT-23-2263-72
Trans. of Problemy Fiziki Atmosfery (USSR) n8 p112-123 1970.

Descriptors: *Atmospheric physics, *Aerosols, Humidity, Condensation, Particle size, Chemical composition, Distribution, Experimental design, Translations, USSR.

Contents: The theory of condensation Growth of Aerosol Particles, calculating condensation growth of individual particles of different chemical composition during changes in relative humidity, calculations of the distribution of aerosol particles by size of various levels of relative humidity, calculation of optical properties of aerosol distribution, and experimental research in condensation growth of particles.

AD-776 533/2GA Reprint
Pittsburgh Univ Pa Dept of Physics
MEASUREMENTS OF THE O(+) + N2 AND O(+) + O2 REACTION RATES FROM 300 DEG K TO EV,
R. Johnsen, and Manfred A. Biondi. 31 May 73, 8p AROD-11166.2-P
Grant DA-ARO-D-31-124-73-G79
Availability: Pub. in The Jnl. of Chemical Physics, v59 n7 p3504-3509, 1 Oct 73.

Descriptors: *Nitrogen, *Oxygen, *Atmospheric chemistry, *Ionosphere, Ions, Reaction kinetics.
Identifiers: Ion molecule interactions, Drift tube mass spectroscopy, F region.

The rates and energy dependences of the reactions O(+) + N2 to NO(+) + O2 to O + O2(+) were studied in a drift tube/mass spectrometer apparatus. At 300K rate coefficients are found for the reactions. Both reactions are of particular importance in converting atomic O(+) ions in the earth's ionosphere (E and F regions) into molecular ions. The present measurements extend previous rate coefficient determinations to ion energies appropriate to F region conditions. (Modified author abstract)

AD-776 545/6GA PC$3.00/MF$.145
Naval Research Lab Washington D C
PRELIMINARY REPORT IN NUMERICAL SIMULATION OF TYPE II IRREGULARITIES IN THE EQUATORIAL ELECTROJET.
Memorandum rept.,
B. E. McDonald, T. P. Coffey, S. Ossakow, and R. N. Sudan. Mar 74, 19p Rept no. NRL-MR-2747

Descriptors: *Ionospheric disturbances, *Computerized simulation, Ion density, Velocity, Electrostatics, Fluid dynamics.
Identifiers: *Equatorial electrojet.

A computer simulation accounts for some of the observed features of short wavelength irregularities in the equatorial electrojet. Two dimensional fluid equations for ion number density, velocity, and electrostatic potential are solved in the rest frame of the neutral atmosphere. The initial configuration is gradient-drift unstable. Growth of small amplitude fluctuations agrees with linear theory. When the density fluctuation reaches about 5%, nonlinear effects become noticeable. As the instability grows, the flow becomes similar to 2D turbulence. The late time spectral power decreases as K to the minus 3.5 power in agreement with theory and observations. (Author)

AD-776 590/2GA PC$3.00/MF$1.45
Saclant ASW Research Centre La Spezia (Italy)
A COMPARISON OF FORMULAE USED IN CALCULATING THE HEAT BUDGET AT THE AIR/SEA INTERFACE,
David J. T. Carter. 15 Jan 74, 23p Rept no. SACLANTCEN-SM-37

Descriptors: *Air water interactions, *Heat transfer, Formulas(Mathematics), Ocean surface, Heat loss, Italy, Norwegian Sea.

Different formulae have been proposed by various authors for the computation of heat-flow across the air/sea interface. Some of these formulae are examined in order to decide which ones to use for hourly heat-budget computations from meteorological observations made in the Norwegian Sea during MILOCSURVNORLANT. A comparison of these formulae indicates the inaccuracies to be expected from computing hourly heat flow using meteorological records. Formulae are selected to compute solar altitude and to compute dew point, humidity, and vapour pressure from dry and wet bulb readings. (Author)

AD-776 660/3GA PC$4.75/MF$1.45
Iowa Univ Iowa City Dept of Physics and Astronomy
THERMAL AND SUPRATHERMAL PLASMA DENSITIES IN THE OUTER MAGNETOSPHERE.
Progress rept.,
Donald A. Gurnett, and Louis A. Frank. Oct 73, 31p Rept no. U. of Iowa-73-37
Contracts N00014-68-A-0196, NAS5-11074
Sponsored in part by Contract NAS5-11039 and Grant NGL-16-001-043.

Descriptors: *Magnetosphere, *Plasmas(Physics), Electron density, Protons, Scientific satellites.
Identifiers: IMP-6 satellites.

Using the low-frequency cutoff of electromagnetic noise trapped in the magnetosphere at frequencies above the local plasma frequency it is now possible to make very accurate, plus or minus 1%, electron density measurements in the low density region between the magnetopause and plasmapause. This technique for measuring the total plasma density has been used, together with measurements of the suprathermal proton intensities with the LEPEDEA instrumentation on the IMP-6 spacecraft, to determine the thermal proton densities in the region between the plasmapause and magnetopause. (Modified author abstract)

AD-776 685/0GA Reprint
Stanford Research Inst Menlo Park Calif
O(SINGLET S) QUENCHING PROFILE BETWEEN 75 AND 115 KM,
T. G. Slanger, and G. Black. 20 Mar 73, 6p AROD-8279.7-C
Contract DAHC04-70-C-0034

Descriptors: *Quenching(Inhibition), *Aeronomy, *Aurorae, Oxygen, Atomic energy levels, Upper atmosphere.
Identifiers: *Oxygen atoms.

The rate at which O(singlet S) is quenched in the atmosphere has been calculated as a function of altitude in the 75-115 km region. Recent measurements of the temperature-dependent O2 quenching rate coefficient have been used, while for quenching by O(triplet P), an expression combining new theoretical and experimental results is employed. For the O(triplet P) altitude profile, the Jacchia model is chosen. (Modified author abstract)

AD-776 874/0GA Reprint
Alaska Univ College Geophysical Inst
TRANS-AURORAL ZONE AURORAL INFRASONIC WAVE OBSERVATIONS,
C. R. Wilson. 28 Jun 73, 26p Rept no. UAG-Contrib-B293 AFOSR-TR-74-0441
Contract F44620-71-C-0064
Availability: Pub. in Planetary and Space Science, v22 p151-173 1974.

Descriptors: *Ionospheric disturbances, *Aurorae, *Infrasonics, Magnetic disturbances, Statistical data, Tables(Data), Wave propagation.

The auroral infrasonic wave (AIW) substorm morphologies are compared for two trans-auroral zone station, Inuvik, N.W.T. Canada (70.4 dip lat) and College, Alaska (64.6 dip lat), that lie along the same magnetic meridian with a north-south separation of 738 km. (Modified author abstract)

AD-776 950/8GA PC$4.50/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
SURVEY OF TWO-BODY AND THREE-BODY REACTION-RATE COEFFICIENTS FOR THE IONIZED STRATOSPHERE AND MESOSPHERE,
Franklin E. Niles. Mar 74, 107p Rept no. BRL-1702

Descriptors: *Stratosphere, *Mesosphere, *Aeronomy, Upper atmosphere, Cations, Anions, Gas ionization, Excitation, Reaction kinetics, Atmospheric chemistry, Ionosphere, Electron capture, Dissociation, Electrons, Computer programming.
Identifiers: *Reaction rates, Ion molecule interactions, Ion ion interactions, D region, AIRCHEM computer code.

Rate coefficients for two-body and three-body reactions applicable to the ionized stratosphere and mesosphere have been surveyed. The reactions are divided into five classes, viz., (1) positive-ion reactions, (2) electron reactions, (3) negative-ion reactions, (4) ion-ion reactions, and (5) neutral reactions. Reactions and their measured rate coefficients are given in tables and the values selected for inclusion in the AIRCHEM atmospheric deionization computer code are identified. The current status of knowledge regarding these reactions is summarized. (Author)

AD-776 969/8GA PC$3.75/MF$1.45
Lowell Technological Inst Research Foundation Mass
ROUTINE OPERATION OF DIGISONDE AT MAYNARD, MASSACHUSETTS.
Final rept. 1 Sep 71-31 Aug 72,
Klaus Bibl, Bodo W. Reinisch, Sheryl Smith, and Robert K. Temple. Jun 73, 64p Rept no. LTIRF-356/IP AFCRL-TR-73-0348
Contract F19628-72-C-0061

Descriptors: *Ionospheric sounding, Digital systems, Data acquisition, Data processing, Digital recording systems, Calibration, Maintenance, Electron density.
Identifiers: E region, F region, *Digisondes, *Ionosondes.

Digital Ionosonde DGS 128-3 was operated and maintained at Maynard, Massachusetts, during the period from 31 August 1971 to 31 August 1972. Continuous monitoring of the ionosphere by vertical pulse sounding produced twelve months of ionospheric data for E- and F-region studies. Digital data, obtained for more than 98 per cent of the entire period, was recorded continuously on magnetic tape. Hourly ionograms were produced on-line by a printer using a special number font. Magnetic tape and hourly ionograms, collected daily, were reduced and scaled for seventeen URSI parameters and presented for publication in the AFCRL Geophysics and Space Data Bulletin. A unique calibration scheme was implemented which automatically recorded the system amplitude versus frequency response and system linearity. (Author)

AD-776 971/4GA PC$3.75/MF$1.45
Texas Univ El Paso Dept of Electrical Engineering
ATMOSPHERIC MODELING FOR MOLECULAR ABSORPTION RESEARCH PROJECT.
Final rept.,
Joseph H. Pierluissi. 31 Jan 74, 65p Rept no. PR2-74-AM-5
Contract DAAD07-73-C-0127

Descriptors: *Atmosphere models, *Transmittance, *Infrared spectra, Computer programs, Absorption spectra, Computerized simulation, Water vapor, Carbon dioxide, FORTRAN, Surface targets.
Identifiers: *Atmospheric attenuation, Remote sensing.

The project developed a number of phenomenological and physical variations of the five-parameter band model for molecular transmittance in the infrared using data from line-by-line calculations in the 15 micron - CO2 band. Conversion from a standard inhomogeneous atmosphere to a homogeneous medium is obtained with the use of modified Curtis-Godson relations and calculated line intensities averaged over 5/cm. Comparisons are made between the calculated and original data indicating that band modeling yields accuracies comparable to the degree of validity of the original transmittance provided that the number and nature of the band parameters are allowed spectral dependence. (Modified author abstract)

BMBW-FB-W-72-24 PC$5.45/MF$1.45
Zentralstelle fuer Luft- und Raumfahrtdokumentation und -Information, Muenchen (F.R. Germany).
REPORT ABOUT THE EXTENDED MISSION OF THE SATELLITE INJUN-V.
J. W. Muench, G. R. Pilkington, E. Kirsch, and B. Hente. Aug 72, 67p
In German. U.S. Sales Only.

Descriptors: (*Satellites, *Data transmission), (*Ionosphere, Satellites), (*Magnetosphere, Satellites), Alpha particles, Cosmic radiation, Data processing, Electrons, Protons.

For abstract, see NSA 29 07, number 16738.

COM-74-50087-354/GA MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
IONOSPERIC DATA.
Feb 74, 132p NOAA-ISPDA-FA-354 NOAA-74031202
Paper copy available from National Climatic Center, Federal Bldg., Asheville, N.C.

Descriptors: *Ionosphere, Statistical data, Tables(Data), Electron density, Ionospheric propagation, Ionospheric disturbances.

Beginning with the January 1973 issue the contents of Ionospheric Data have been changed from the traditional of all monthly median data available at the time of issue, regardless of the date of observation. The publication now contains monthly medians only for the same month the publication is issued. For example, the January 1973 issue includes all the data available for January 1973 and any previous unpublished data for January from earlier years. Also published are detailed data for the same month from an exemplary station, Wallops Island (Washington) including daily-hourly values of all characteristics, f-plots for Regular World Days, and an N(h) contour graph. As timely information, there is included selected ionospheric data for a Retrospective World Interval, when appropriate. Also given is information on ionospheric data recently received at World Data Center A for Solar-Terrestrial Physics and other information on availability of data from the WDC's.

COM-74-50228/7GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
SOME ACTIVE MAGNETOSPHERE EXPERIMENTS TO BE PERFORMED BY THE PLASMA PHYSICS AND ENVIRONMENTAL PERTURBATION LABORATORY.
Technical rept.,
W. Bernstein, and D. S. Evans. Jul 73, 77p NOAA-TR-ERL-286, SEL-27 NOAA-74021907
Paper copy available from GPO $1.15 as C55.13:ERL 286-SEL 27.

Descriptors: *Magnetosphere, *Atmospheric physics, Plasmas(Physics), Ionosphere, Plasma interactions, Reentry vehicles, Magnetic fields, Electric fields, Experimental design.
Identifiers: Ionospheric modification, Chemical release studies, Meteor trails.

A number of general studies that have been proposed for PPEPL/shuttle program are considered in qualitative detail both from the theoretical and practical points of view. The selection of experimental programs was restricted to those which may be considered active as opposed to refinements of the passive observational programs done previously. It is concluded that while these new studies were scientifically worthwhile and could be performed in principle, in most cases insufficient attention had been paid to the practical details of the experiments. Several specific areas of study, stressing in particular the practical feasibility of the proposed experiments, are recommended. In addition, recommendations are made for further theoretical study, where appropriate. (Author)

COM-74-50276-31/GA MF$1.45
World Data Center A for Solar-Terrestrial Physics, Boulder, Colo.
AURORAL ELECTROJET MAGNETIC ACTIVITY INDICES AE (11) FOR 1969,
Joe Haskell Allen, Carl C. Abston, and Leslie D. Morris. Feb 74, 147p UAG-31 NOAA-74031106
Paper copy available from National Climatic Center, Federal Bldg. Attn: Publications, Asheville, N.C. 28801 $9.00/year, $0.75/copy.

Descriptors: *Auroral electrojets, Tables(Data), Magnetic disturbances.

The Auroral Electrojet index (AE) is discussed and a brief description is given of the derivation of 11-station 2.5-min AE indices for 1969. Tables are given of hourly average indices for each day of the year, of the stations making the main contribution to the hourly indices, and of the average monthly quiet-time level of horizontal fields (H) at each magnetic observatory. Graphs of the index variations are included for each day of 1969. (Author)

CONF-731209-1 PC$4.00/MF$1.45
Union Carbide Corp., Oak Ridge, Tenn. (Usa). Computer Sciences Div.; Usaec Division of Biomedical and Environmental Research, Washington, D.C.
MODEL FOR SUSPENSION AND ATMOSPHERIC TRANSPORT OF DUST.
M. T. Mills, and J. S. Olson. 1973, 37p

Descriptors: (*Dusts, *Diffusion), Aerosols, Air pollution, Computers, Earth atmosphere, Mathematical models, Surface air.

For abstract, see NSA 29 07, number 18018.

COO-1340-35 PC$3.00/MF$1.45
Colorado State Univ., Fort Collins (Usa). Dept. Of Atmospheric Science.
AGE ESTIMATES OF STRATOSPHERIC AIR.
E. R. Reiter. Aug 73, 15p
Contract AT(11-1)-1340

Descriptors: (*Beryllium 7, Stratosphere), (*Phosphorus 32, Stratosphere), (*Stratosphere, *Air), (*Troposphere, Air), Abundance, Age estimation.

For abstract, see NSA 29 07, number 16715.

DNA-3211-F PC$4.00/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. (Usa). Environmental Research Labs.
INVESTIGATIONS OF ATMOSPHERIC ION--NEUTRAL PROCESSES. FINAL REPORT.
E. E. Ferguson, A. L. Schmeltekopf, F. C. Fehsenfeld, and D. L. Albritton. Jul 73, 12p

Descriptors: (*Ionosphere, *Ion-molecule collisions), Ions, Kinetic energy, Molecules, Reaction kinetics.

For abstract, see NSA 29 07, number 16716.

JPRS-61377 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
THE EARTH'S OZONE SHIELD,
A. Kh. Khrgian. 4 Mar 74, 13p
Trans. of Priroda (USSR) n11 p22-27 Nov 73.

Descriptors: *Earth atmosphere, *Ozone, Photochemical reactions, Exhaust gases, Concentration(Composition), Air pollution, Urban areas, Translations, USSR.

The report contains a study of the ozone shield as part of the global problem of the conservation of the environment.

N74-17189/1GA PC$9.00/MF$1.45
GCA Corp., Bedford, Mass. Technology Div.
INVESTIGATION OF THE D AND E REGIONS OF THE IONOSPHERE.
Final Report.
R. N. Kelly, A. Engelman, and A. F. Tobey. Nov 73, 116p NASA-CR-136941, GCA-TR-73-6-N
Contract NASW-1994

Descriptors: *D region, *E region, *Rocket sounding, *Solar eclipses, Ionosphere, Magnetic storms, Spordic e layer.

For abstract, see STAR 1208

N74-17112/3GA PC$4.50/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
MEAN MERIDIONAL CIRCULATION IN THE SOUTHERN HEMISPHERE STRATOSPHERE DURING THE POLAR NIGHT.
R. F. Adler. Nov 73, 29p NASA-CR-136828, CSU-ATS-209
Contract NGR-06-002-098

Descriptors: *Atmospheric circulation, *Meridional flow, *Satellite observation, *Southern hemisphere, Northern hemisphere, Stratosphere, Winter.

For abstract, see STAR 1208

N74-17113/3GA PC$9.25/MF$1.45
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
PROPERTIES OF WATER VAPOR RELEVANT TO ITS MEASUREMENT IN THE STRATOSPHERE AND MESOSPHERE.
R. L. Longbothum. 23 Jan 74, 123p NASA-CR-136736, PSU-IRL-SCI-420
Contracts NGL-39-009-003, NSF GA-33446X

Descriptors: *Chemical composition, *Literature, *Mesosphere, *Stratosphere, *Surveys, *Water vapor, Atmospheric composition, Atmospheric moisture, Moisture content, Radiative transfer.

For abstract, see STAR 1208

N74-17114/1GA PC$4.50/MF$1.45
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
THERMAL AND SUPRATHERMAL PLASMA DENSITIES IN THE OUTER MAGNETOSPHERE.
D. A. Gurnett, and L. A. Frank. Oct 73, 30p
NASA-CR-136735, U-OF-IOWA-73-37
Contracts NAS5-11074, NAS5-11039

Descriptors: *Magnetosphere, *Plasma density, *Thermal plasmas, Electron density (Concentration), Explorer 34 satellite, Protons.

For abstract, see STAR 1208

N74-17116/6GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ION COMPOSITION AND DRIFT OBSERVATIONS IN THE NIGHTTIME EQUATORIAL IONOSPHERE.
R. A. Goldberg, A. C. Aikin, and B. V. K. Murthy. Feb 74, 23p NASA-TM-X-70593, X-625-74-50
Subm-Submitted for Publication.

Descriptors: *Ionospheric composition, *Ionospheric drift, *Night sky, E region, F region, Nitrogen, Oxygen.

For abstract, see STAR 1208

N74-17120/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AVERAGE DAILY VARIATIONS IN THE MAGNETIC FIELD AS OBSERVED BY ATS-5.
T. L. Skillman. Mar 74, 44p NASA-TN-D-7496, G-7338

Descriptors: *Ats 5, *Magnetic fields, *Magnetic variations, Diurnal variations, Geomagnetic latitude, Harmonic analysis.

For abstract, see STAR 1208

N74-17326/1GA PC$5.25/MF$1.45
Alaska Univ., Fairbanks. Geophysical Inst.
COORDINATED OBSERVATIONS OF CHEMICAL RELEASES FROM THE GROUND AND FROM AIRCRAFT AT HIGH LATITUDES.
Final Report, 1 Oct. 1972 - 30 Jun. 1973.
G. J. Romick. 30 Jun 73, 41p NASA-CR-136944
Contract NGR-02-001-094

Descriptors: *Atmospheric circulation, *Geomagnetism, *Nike-apache rocket vehicle, Payloads, Trajectory analysis, Wind measurement.

For abstract, see STAR 1208

PB-230 774/2GA PC$4.25/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Mordialoc (Australia). Div. of Atmospheric Physics.
SOLAR RADIATION STATISTICS FOR AUSTRALIA,
G. W. Paltridge. 1974, 25p Technical paper-23, ISBM-0-643-00082-8

Descriptors: *Solar radiation, *Australia, Statistical data, Intensity, Cloud cover.

Contour maps of seasonal average solar radiation parameters are computed from detailed cloud cover information. The parameters include direct and global fluxes on horizontal, inclined and 'sun-tracking' surfaces. Contour maps of cloud cover probabilities are included. (Author)

TRITA-EPP-73-14 PC$3.50/MF$1.45
Kungliga Tekniska Hoegskolan, Stockholm (Sweden). Institutionen Foer Plasmafysik.
THEORETICAL AND EXPERIMENTAL CONSIDERATIONS BEHIND BALLOON-BORNE ELECTRIC FIELD EXPERIMENTS.
R. Bostroem, and U. Fahleson. Sep 73, 27p
U.S. Sales Only.

Descriptors: (*Electric fields, Ionosphere), (*Ionosphere, *Variations), Balloons, Probes, Signals.

For abstract, see NSA 29 07, number 16717.

TT-67-51394/2 PC$9.75/MF$1.45
National Science Foundation, Washington, D.C.
ATMOSPHERIC ELECTRICITY. VOLUME II. FIELDS, CHARGES, CURRENTS (ATMOSPHAERISCHE ELEKTRIZITAET),
Hans Israel, and Hans Dolezalek. 1973, 507p
Errata Sheet attached. Trans. of Probleme der Kosmischen Physik (East Germany) v29 1961, by D. Ben Yaskov and Baruch Benny. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Atmospheric electricity, *Books, Electric fields, Space charge, Electric current, Thunderstorms, Lighting, Atmospherics, Translations, East Germany.

Contents: The atmospheric electric field, Charges, Currents, Thunderstorm problems, Supplementary remarks, Measuring techniques, reference tables, supplements, corrections to volume I, Indices.

TT-74-50009 PC$5.75/MF$1.45
National Science Foundation, Washington, D.C.
ACTINOMETRY, ATMOSPHERIC OPTICS, OZONOMETRY (AKTINOMETRIYA, ATMOSFERNAYA OPTIKA, OZONOMETRIYA),
G. P. Gushchin. 1974, 206p
Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n279 1972, by H. Olaru. Errata sheet included. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Atmospheric physics, Atmospheric radiation, Infrared radiation, Light transmission, Hygrometers, Ultraviolet radiation, Measuring instruments, Visibility, Ozone, Photochemical reactions, Supersonic aircraft, Transport aircraft, Translations, USSR.

UCRL-75194 PC$3.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
RECENT STUDIES OF THE SUSPENSION OF DESERT DUST AND RESUSPENSION OF TOXIC AEROSOL DUE TO WIND.
W. M. Porch. Dec 73, 21p

Descriptors: (*Dusts, *Diffusion), (*Aerosols, Diffusion), Air pollution, Deserts, Earth atmosphere, Meteorology, Surface air, Turbulence, Velocity, Wind.

For abstract, see NSA 29 07, number 18027.

4B. Meteorology

AD-776 302/2GA PC$9.50/MF$1.45
Naval Postgraduate School Monterey Calif
ESTIMATING BOUNDARY LAYER FLUXES FROM SHIPBOARD MEASUREMENTS OF DISSIPATIONS OF TURBULENT KINETIC ENERGY AND TEMPERATURE VARIANCE.
Master's thesis,
William Edward Johnston. Mar 74, 130p

Descriptors: *Marine atmospheres, *Turbulent boundary layer, Turbulence, Kinetic energy, Momentum transfer, Air water interactions, Theses.

Velocity and temperature fluctuation measurements were made over the open ocean from instruments mounted on the R/V ACANIA. These data were examined to determine the validity of present formulations and prediction techniques. Values of momentum flux, were inferred from the rate of dissipation of turbulent kinetic energy, epsilon. Dissipation values were obtained from spectral estimates and inner scale estimates. The momentum flux, computed from spectra, supported the constant-flux assumption for neutral conditions. For periods of instability, the stability corrections applied to the vertical variation of epsilon resulted in the proper adjustments toward the predicted slope. The shape of a spectrum of temperature fluctuations was in agreement with predictions. (Modified author abstract)

AD-776 304/8GA PC$7.50/MF$1.45
Naval Postgraduate School Monterey Calif
RADIATIVE PARAMETERIZATION FOR THE FNWC GLOBAL PRIMITIVE EQUATION MODEL.
Master's thesis,
Frank Wright Jenks, III. Mar 74, 88p

Descriptors: *Earth atmosphere, *Solar radiation, Atmosphere models, Absorption(Physical), Reflection, Cloud cover, Atmospheric sounding, Pacific Ocean, Mathematical models, Theses.
Identifiers: Numerical weather forecasting, Primitive equations.

The study was an evaluation of a radiational scheme for inclusion in a numerical weather prediction model. This scheme uses empirical formulations for atmospheric absorptivities, scattering and reflectivity and cloud and earth surface reflectivity to compute the solar insolation received and absorbed by the earth and key atmospheric layers. Longwave cooling by the earth is also treated with empirically derived emissivities for water-vapor and carbon dioxide. This radiation model includes a two-layer cloud parameterization scheme and calculates the effect of an additional cloud layer on previous studies. (Modified author abstract)

AD-776 306/3GA PC$6.50/MF$1.45
Naval Postgraduate School Monterey Calif
EXAMINATION OF SHIPBOARD MEASUREMENTS OF THE VERTICAL PROFILES OF MEAN TEMPERATURE, HUMIDITY AND WIND SPEED.
Master's thesis,
Michael Patrick Cavanaugh. Mar 74, 69p

Descriptors: *Marine atmospheres, *Turbulent boundary layer, Air water interactions, Atmospheric temperature, Momentum transfer, Heat transfer, Wind velocity, Theses, Computer programs.

The suitability of shipboard profile measurements of mean temperature, mean humidity and mean wind over the open ocean is examined on the basis

of six hours and 20 minutes of simultaneous profile measurements made from the R/V Acania on 20-21 September 1973 near San Nicolas Island, California. Comparisons of the profiles obtained from the shipboard measurements, as well as the meteorological parameters derived from those profiles are made with results obtained from more stable platforms. Parameters examined include the Richardson number, the friction velocity, the drag coefficient and the roughness length. The results indicate that a ship can be a suitable platform for measuring profiles. (Modified author abstract)

AD-776 307/1GA PC$7.75/MF$1.45
Naval Postgraduate School Monterey Calif
ITERATIVE RETRIEVAL AND STATISTICAL SPECIFICATION OF ATMOSPHERIC THICKNESSES FROM VTPR CLEAR-COLUMN RADIANCE DATA.
Master's thesis,
Douglas Ray Moran. Mar 74, 91p

Descriptors: *Atmospheric sounding, *Atmospheric temperature, Thickness, Meteorological satellites, Radiance, Regression analysis, Computer programming, Theses.
Identifiers: *Remote sensing.

An iterative technique is developed for retrieval of thicknesses of selected atmospheric layers from verticle temperature profile radiometer (VTPR) clear-column radiance measurements. Layer mean temperatures for a simplified atmospheric model are retrieved by direct solution of the radiative transfer equation, and are then used to compute thicknesses of key atmospheric layers bounded by commonly used pressure levels. The retrieval technique illustrates the use of reference wave numbers that vary from layer to layer. Transmittance tuning is employed to correct systematic errors in the retrieved mean temperatures. Thicknesses of key layers retrieved by the technique from clear-column radiances observed during a 24 hour period at scan spots between 15 N and 45 N are separated into three latitude-band samples. (Modified author abstract)

AD-776 311/3GA PC$6.75/MF$1.45
Naval Postgraduate School Monterey Calif
THE INCLUSION OF MOISTURE IN A NUMERICAL MODEL OF STEADY-STATE FRONTS.
Master's thesis,
Clifford James Cornelius, Jr. Mar 74, 75p

Descriptors: *Atmospheric motion, *Convection(Atmospheric), Turbulent diffusion, Latent heat, Steady state, Partial differential equations, Mathematical models, Theses.
Identifiers: *Fronts(Meteorology), *Advection.

The numerical frontogenesis model of Williams (1973) is modified to include moisture with its subsequent condensation and release of latent heating. The turbulent diffusions of momentum, heat and moisture are represented with various coefficients. The numerical solutions show realistic quasi-steady fronts forming within one to two days. These solutions are examined and compared over a range of the various coefficients, and various ranges of temperature. Inclusion of moisture in the model causes intensification of baroclinicity at mid and upper levels. Also noted is a sensitivity of the moist model to reference potential temperature due to the exponential relationship between saturation vapor pressure and temperature. (Author)

AD-776 314/7GA PC$5.50/MF$1.45
Naval Postgraduate School Monterey Calif
NUMERICAL PREDICTION OF THE MEAN WIND OVER WATER WAVES.
Master's thesis,
Kenneth G. Dunning. Mar 74, 48p

Descriptors: *Wind, *Air water interactions, *Ocean waves, Weather forecasting, Mathematical models, Numerical analysis, Boundary layer, Wind velocity, Buoyancy, Theses.
Identifiers: Numerical weather forecasting.

Stauffer (1973) developed a theoretical model for the prediction of the air flow above ocean waves. In this study his results were extended with the addition of buoyancy effects and two different lower boundary conditions. The numerical solutions show general agreement with the observational analyses of wave modified wind profiles by Davidson (1974). However, these comparisons are not conclusive because of the sensitivity in the lower boundary conditons. (Modified author abstract)

AD-776 333/7GA PC$4.50/MF$1.45
Army Electronics Command Fort Monmouth N J
PREDICTION OF MESOSCALE FLOWS OVER COMPLEX TERRAIN.
Research and development technical rept.,
Richard A. Anthes, and Thomas T. Warner. Mar 74, 108p Rept no. ECOM-5532
Also available as Atmospheric Sciences Research Paper no. 85.

Descriptors: *Atmospheric circulation, *Weather forecasting, Short range(Time), Army operations, Surface roughness, Atmospheric temperature, Equations of motion, Partial differential equations, Finite difference theory, Topography.
Identifiers: Numerical weather forecasting.

A method was developed for analysis of atmospheric flows with spatial resolution on the order of a few kilometers and short-range prediction on the order of a few hours. The objective was to evaluate problems associated with development of operational mesoscale numerical prediction in the proposed Army Automatic Meteorological System (AMS). The equations of motion are written in generalized sigma (relative pressure) coordinates with provision for a variable number of levels and a variable top pressure surface. Numerical experiments were performed over very rough terrain covering a domain of almost 150x150 km. (Modified author abstract)

AD-776 334/5GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
MICROPHYSICAL EVOLUTION OF FOG.
Research and development technical rept.,
Richard D. H. Low. Mar 74, 29p Rept no. ECOM-5533

Descriptors: *Fog, *Cloud physics, Microstructure, Condensation, Particle size, Distribution, Statistical data, Physical properties, Life expectancy.

There is a paucity of data on the microphysical structure and life history of fogs. In two documented field programs, the microphysical and meteorological data of five warm radiation and radiation-advection fogs were collected at regular time intervals from onset through dissipation. In this paper, the statistical parameters of the microphysical data are presented, and analyses made thereof with a view to delineating the formative, mature, and dissipative stages of fog evolution in terms of five parameters: droplet and cloud nucleus concentrations, liquid water content, visibility, and supersaturation. (Modified author abstract)

AD-776 390/7GA PC$3.25/MF$1.45
Nevada Univ Reno Lab of Atmospheric Physics
AN EXPERIMENTAL STUDY OF THE FREEZING OF DROPS IN FREE FALL.
Final rept. 5 Jun 70-4 Sep 73,
Thomas E. Hoffer, and Marc L. Pitchford. Jan 74, 50p AROD-9095.1-EN
Grant DA-ARO-D-31-124-70-G81

Descriptors: *Atmospheric physics, *Water, *Drops, Free fall, Nucleation, Ice, Freezing, Lead compounds, Iodides, Particle size, Computer programs.
Identifiers: Phloroglucinol.

One process to explain natural ice pellets in the atmosphere is the heterogeneous freezing of large cloud drops. These experiments show that this process is of little importance. Drops of about 180 micrometer diameter which fell through high concentrations of aerosol nucleating particles showed consistantly very low percentages of freezes. From the information gathered a temperature threshold for lead iodide and phloroglucionol of -10C. and -6C respectively was determined. Also a dependence on the relative humidity of the air in the vicinity of particle collection was observed. This gave rise to relative humidity thresholds of 65% for lead iodide and 75% for phloroglucionol. The nucleating ability of airborne ice crystals was experimentally tested and found to be much lower than expected. This difference is attributed to a collection efficiency for drops collecting nonspherical ice crystals, which is much lower than a calculated collection assuming the ice to be spherical. (Author)

AD-776 396/4GA PC$31.25/MF$1.45
National Climatic Center Asheville N C
SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS, WESTERN EUROPEAN COASTAL MARINE AREAS. VOLUME 5. AREA 24 - ESBJERG, AREA 25 - DOGGER BANKS, AREA 26 - NORTH SEA, AREA 27 - SHETLAND IS. SE, AREA 28 - STAVANGER, AREA 29 - BERGEN, AREA 30 - ALESUND.
Jan 74, 565p
Sponsored by Naval Weather Service Command, Washington, D.C. See also Volume 4, AD-775 435.

Descriptors: *Marine meteorology, *Coastal regions, *Western Europe, Air water interactions, Meteorological data, Climate, Atmospheric precipitation, Wind, Ocean waves, Cloud cover, Visibility, Atmospheric temperature, North Sea, Denmark, Norway.
Identifiers: Esbjerg(Denmark), Dogger Bank, Shetland Islands, Stavanger(Norway), Bergen(Norway), Alesund(Norway).

The data contained in these tables were obtained from Tape Data Family 11 (TDF-11) Marine Surface Observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of Coastal Marine Summaries. The report concerns Western European Coastal Marine Areas, namely, Esbjerg, Dogger Banks, North Sea, Shetland Is. SE, Stavanger, Bergen, Alesund.

AD-776 398/0GA PC$9.50/MF$1.45
IBM Federal Systems Div Gaithersburg Md
GLOBAL WEATHER MODELING WITH VECTOR SPHERICAL HARMONICS,
Sven Bjorklund. 10 Nov 73, 129p Rept no. 2
AROD-10814.2-A
Contract DAHC04-72-C-0020, ARPA Order-2089
See also Rept. no. 1, AD-752 569.

Descriptors: *Weather forecasting, Hydrodynamics, Partial differential equations, Special functions(Mathematical), Vector analysis, Computer programming, Mathematical models.
Identifiers: *Spherical harmonics, *Numerical weather forecasting, Primitive equations.

The report presents the current status of the work under ARPA order number 2089, dealing with weather modeling with a view toward climatological applications. Emphasis is on the solution of the primitive equations governing weather by means of vector spherical harmonics.

AD-776 404/6GA PC$5.75/MF$1.45
Stanford Research Inst Menlo Park Calif
CONDENSATION NUCLEI AND AEROSOL POPULATIONS RELATED TO FOG FORMATION.
Final rept. no. 2, 1 Jun 67-31 Dec 73,

Francis L. Ludwig, Samuel Schecter, Robert C. Robbins, and James Hart Smith. Jan 74, 212p
AROD-7257.9cEN
Contract DAHC04-67-C-0059
See also AD-700 137.

Descriptors: *Fog, *Stratus clouds, *Cloud physics, Aerosols, Condensation, Sulfur, Isotope availability, Particle size, Mathematical models, San Francisco Bay.

The nature of stratus and fog droplets and associated aerosols was studied in the field, in the laboratory, and through numerical modeling of condensation processes.

AD-776 465/7GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
RELATIONSHIP BETWEEN MIDSTRATOSPHERIC TEMPERATURES AND TROPOSPHERIC SYNOPTIC FEATURES,
David Rind, and Vito Pagnotti. 12 Mar 73, 13p
Rept no. LDGO-1997 AROD-6997.32-EN
Grant DA-ARO-D-31-124-71-G90
Revision of report dated 10 Jul 72.
Availability: Pub. in Monthly Weather Review, v101 n6 p475-485 Jun 73.

Descriptors: *Weather, *Stratosphere, Atmospheric temperature, Correlation techniques, Atmospheric circulation, Winter.

The relationship between midtropospheric synoptic features and midstratospheric temperatures in winter is investigated by examining averages of 5-10 yr of observations, monthly mean observations, and daily records. It is found that midstratospheric warm regions lie above midtropospheric troughs and subtropical ridges, while stratospheric cold regions occur above high-latitude tropospheric ridges. Thus, at high latitudes, an inverse correlation exists between 500-mb height and 10-mb temperatures; this correlation seems to be simultaneous in nature. The implications of these results are discussed with relation to the general circulation of the stratosphere, and in particular to the relative importance of hydrostatic adjustment, planetary wave propagation, and tidal energy. (Author)

AD-776 577/9GA PC$5.00/MF$1.45
Chicago Univ Ill Lab for Atmospheric Probing
ON THE ORIGIN AND STRUCTURE OF RADAR ECHO LAYERS IN THE CLEAR ATMOSPHERE.
Technical rept.,
James I. Metcalf. 1 Jan 74, 163p Rept no. TR-34
Contract N00014-67-A-0285-0014, Grant DA-ARO-D-31-124-71-G71
Doctoral thesis.

Descriptors: *Clear air turbulence, *Radar reflections, Stratification, Microstructure, Gravity wave, Theses.

A field project was conducted at San Diego, California, to investigate the structure of waves and radar echoes in the low-level marine inversion. A variety of data are presented to illustrate the dynamical processes at work in the surface layer and in the inversion above. Implications of these results for further studies of atmospheric waves and turbulence are discussed. (Modified author abstract)

AD-776 611/6GA PC$27.00/MF$1.45
Environmental Technical Applications Center (Air Force) Washington D C
U.S. NAVAL WEATHER SERVICE WORLD-WIDE AIRFIELD SUMMARIES. VOLUME XI. EASTERN EUROPE AND USSR. PART 1 (EASTERN EUROPE).
Apr 73, 477p
See also Part 2, AD-776 612.

Descriptors: *Climate, *Landing fields, *Europe, *USSR, Ceiling, Visibility, Atmospheric precipitation, Atmospheric temperature, Barometric pressure, Humidity, Wind, Snow, Rainfall, Thunderstorms, Cloud cover, Tables(Data), Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania.

The volume is part of a series of compilations which is world-wide in scope. It consists of climatological summaries for selected airfields and for the climatic areas in which they are located. This volume provides climatological summaries for airfields and climatic areas in Eastern Europe and USSR.

AD-776 612/4GA PC$27.25/MF$1.45
Environmental Technical Applications Center (Air Force) Washington D C
U.S. WEATHER SERVICE WORLD-WIDE AIRFIELD SUMMARIES. VOLUME XI. EASTERN EUROPE AND USSR. PART 2 (USSR).
Apr 73, 482p
See also Part 1, AD-776 611.

Descriptors: *Climate, *Landing fields, *USSR, Ceiling, Visibility, Cloud cover, Atmospheric temperature, Atmospheric precipitation, Barometric pressure, Humidity, Wind, Snow, Rainfall, Thunderstorms, Tables(Data).

The volume is part of a series of compilations which is world-wide in scope. It consists of climatological summaries for selected airfields, and for the climatic areas in which they are located. This volume provide climatological summaries for airfields and climatic areas in USSR.

AD-776 615/7GA PC$22.75/MF$1.45
Naval Weather Service Environmental Detachment Asheville N C
U.S. NAVAL WEATHER SERVICE WORLD-WIDE AIRFIELD SUMMARIES. VOLUME XII. CHINA, NORTH KOREA, AND MONGOLIA. PART 1 (CHINA).
Feb 74, 397p
See also Part 2, AD-776 616.

Descriptors: *Climate, *Landing fields, *China, Ceiling, Visibility, Cloud cover, Atmospheric temperature, Atmospheric precipitation, Barometric pressure, Humidity, Wind, Snow, Rainfall, Thunderstorms, Tables(Data).

The volume is part of a series of compilations which is world-wide in scope. It consists of climatological summaries for selected airfields and for the climatic areas in which they are located. This volume provides climatological summaries for airfields and climatic areas in China.

AD-776 616/5GA PC$20.75/MF$1.45
Naval Weather Service Environmental Detachment Asheville N C
U.S. NAVAL WEATHER SERVICE WORLD-WIDE AIRFIELD SUMMARIES. VOLUME XII. CHINA, NORTH KOREA, AND MONGOLIA. PART 2.
Feb 74, 352p
See also Part 1, AD-776 615.

Descriptors: *Climate, *Landing fields, *China, *North Korea, Ceiling, Visibility, Cloud cover, Atmospheric temperature, Atmospheric precipitation, Barometric pressure, Humidity, Wind, Snow, Rainfall, Thunderstorms, Tables(Data).
Identifiers: *Mongolia.

The volume is part of a series of compilations which is world-wide in scope. It consists of climatological summaries for selected airfields and for the climatic areas in which they are located. This volume provides climatological summaries for airfields and climatic areas in China, North Korea and Mongolia.

AD-776 730/4GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MODIFICATION OF CONVECTIVE CLOUDS BY JETS,
N. I. Vulfson, A. V. Kondratova, A. G. Laktionov, L. M. Levin, and V. I. Skatskii. 25 Feb 74, 27p
Rept no. FTD-MT-24-217-74
Edited machine trans. of Trudy v Vsesoyuznogo Meteorologicheskogo Sezda. Sektsiya Aktivnykh Vozdeistvii na Atmosfernye Protsessy (USSR) v4 p62-78 1972, by Dean F. W. Koolbeck.

Descriptors: *Artificial precipitation, *Weather modification, Cumulus clouds, Heating, Exhaust gases, Jet engines, Translations, USSR.

Contents:
- Stimulation of convective cloud development by artificially created ascending jets;
- Breaking up cumulus clouds with descending jets.

AD-776 733/8GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
RESULTS OF WORK IN COMBATING HAIL DAMAGE,
I. T. Bartishvili, I. V. Benito, I. I. Burtsev, I. I. Gaivoronoskii, and A. D. Dzhuraev. 25 Feb 74, 24p Rept no. FTD-MT-24-213-74
Edited machine trans. of Trudy v Vsesoyuznogo Meteorologicheskogo Sezda. Sektsiya Aktivnykh Vozdeistvii na Atmosfernye Protsessy (USSR) v4 p23-36 1972, by Dean F. W. Koolbeck.

Descriptors: *Hail, *Weather modification, Reviews, Translations, USSR.

Contents:
- Results of antihail operations using the artillery method in the Northern Caucasus (KPEVGI);
- Results of antihail operations carried out by the rocket method in the Georgian SSR (SBG, IGA N);
- Results of antihail operations by the ZakNIGMI method.

AD-776 745/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INFLUENCE OF THE VERTICAL STRUCTURE OF THE WIND FIELD ON THE DEVELOPMENT OF CUMULUS AND CUMULONIMBUS CLOUDS,
R. S. Pastushkov, and S. M. Shmeter. 8 Mar 74, 25p Rept no. FTD-MT-24-227-74
Edited machine trans. of Trudy v Vsesoyuznogo Meteorologicheskogo Sezda. Sektsiya Aktivnykh Vozdeistvii na Atmosfernye Protsessy (USSR) v4 p178-192 1972, by Dean F. W. Koolbeck.

Descriptors: *Cumulus clouds, *Cumulonimbus clouds, *Cloud physics, Convection, Wind, Partial differential equations, Translations, USSR.

AD-776 747/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
RESULTS FROM RESEARCH ON PROCESSES OF CLOUD FORMATION IN CHAMBERS,
E. A. Aleksandrov, O. A. Volkovitskii, A. G. Laktionov, N. K. Nikiforova, and V. V. Smirnov. 25 Feb 74, 25p Rept no. FTD-MT-24-223-74
Edited machine trans. of Trudy v Vsesoyuznogo Meteorologicheskogo Sezda. Sektsiya Aktivnykh Vozdeistvii na Atmosfernye Protsessy (USSR) v4 p130-145 1972, by Dean F. W. Koolbeck.

Descriptors: *Fog, *Cloud physics, Condensation, Condensation nuclei, Coagulation, Cloud seeding, Aerosols, Experimental design, Cloud chambers, Translations, USSR.
Identifiers: Fog dispersal.

Contents:
- Investigation of the initial stage of formation of the spectrum of cloud drops;

Investigation of local nonuniformities in microphysical characteristics of a fog;
Results of experiments on modification of fog by condensation nuclei;
Study of the diffusion of light aeroions on aerosol particles;
Some results from investigation of the formation of the crystalline phase in a supercooled fog;
New method for determining the concentration of the most active cloud condensation nuclei.

AD-776 752/8GA PC$3.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NUMERICAL MODEL OF GENERAL CIRCULATION OF THE ATMOSPHERE OVER ONE HEMISPHERE.
M. E. Shvets, L. R. Dmitrieva-Arrago, L. N. Magazenko, L. V. Samoilova, and B. E. Shneerov.
25 Feb 74, 66p Rept no. FTD-MT-24-502-73
Edited machine trans. of Gidrodinamicheskie Issledovaniya Tsirkulyatsii Atmosfery (USSR) n256 p3-44 1970, by Dean F. W. Koolbeck.

Descriptors: *Atmospheric circulation, Heat flux, Weather forecasting, Air water interactions, Equations of motion, Partial differential equations, Numerical integration, Translations, USSR.

The article outlines a scheme of the general circulation of the atmosphere which in its physical content differs from previous studies of this problem in that the cloudiness and humidity are not given but are rather determined in the process of integration of the appropriate equations. However, the temperature of the ocean is considered known from climatological data.

AD-776 871/6GA PC$9.75/MF$1.45
National Climatic Center Asheville N C
CEILING-VISIBILITY CLIMATOLOGICAL STUDY AND SYSTEMS ENHANCEMENT FACTORS (BASED ON HOURLY OBSERVATIONS).
Final rept.
Jun 73, 132p
Contract DOT-FA73WAI-330

Descriptors: *Ceiling, *Visibility, *Landing fields, Meteorological data, Tables(Data), Seasonal variations, Diurnal variations.

The climatological data presented herein are intended to assist the Federal Aviation Administration in making Instrument Landing Systems (ILS) investment decisions. A special study prepared by the Aviation Policy Division of the FAA describes the decision model used in the benefit/cost program to support requests for ILS facilities. The tables contained in this report are designed to present the seasonal and diurnal variability of the various ceiling-visibility conditions and system enhancement factors. Each table contains an explanation of the data presented as well as the number of hourly observations examined to develop the percentages.

AD-776 899/7GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
AN ITERATIVE INVERSION OF THE RADIATIVE TRANSFER EQUATION FOR TEMPERATURE PROFILES.
Technical rept.,
Louis D. Duncan. Mar 74, 24p Rept no. ECOM-5534

Descriptors: *Atmospheric temperature, Radiative transfer, Iterations, Meteorological satellites.
Identifiers: Remote sensing.

An iterative technique is developed for determining atmospheric temperature profiles from measurements of the earth's outgoing radiance. The solution is nonlinear, thus allowing for meaningful physical and mathematical results and avoiding computational difficulties which often arise from linear approaches. An algorithm has been developed to increase the rate of convergence. When this algorithm is used, convergence is usually obtained in three iterations. (Author)

AD-776 901/1GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
11607 LANCE MISSILE NO. 2161, ROUND NO. 203 RCT (19 OCTOBER 1973).
Meteorological data rept.
Oct 73, 24p Rept no. DR-798

Descriptors: *Upper atmosphere, *Meteorological data, *Sounding rockets, *Impact prediction, Tables(Data), Elevation, Barometric pressure, Atmospheric temperature, Humidity, Dew point, Atmospheric density, Wind velocity, Wind direction, Cloud cover, Guided missile ranges, New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 11607 Lance, Missile Number 2161, Round Number 203 RCT, are presented in tabular form. (Author)

AD-776 902/9GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
03702 HONEST JOHN MISSILE NO. 1755, ROUND NO. 636 AML (2 NOVEMBER 1973).
Meteorological data rept.
Nov 73, 18p Rept no. DR-800

Descriptors: *Upper atmosphere, *Meteorological data, *Artillery rockets, *Impact prediction, Tables(Data), Elevation, Barometric pressure, Atmospheric temperature, Humidity, Dew point, Atmosppheric density, Wind velocity, Wind direction, Cloud cover, Sounding rockets, Guided missile ranges, New Mexico.
Identifiers: Honest John.

Meteorological data gathered for the launching of 03702 Honest John, Missile Number 1755, Round Number 636 AML, are presented in tabular form. (Author)

AD-776 903/7GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
03702 HONEST JOHN MISSILE NO. 1774, ROUND NO. 637 AML (9 NOVEMBER 1973).
Meteorological data rept.
Nov 73, 24p Rept no. DR-801

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, *Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Atmospheric motion, Humidity, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Honest John.

Meteorological data gathered for the launching of 03702 Honest John, Missile Number 1774, Round Number 637 AML, are presented in tabular form. (Author)

AD-776 904/5GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
16101 LITTLE JOHN, MISSILE NOS. 3131/3117, ROUND NOS. 701 RO/702 RO--(13 NOVEMBER 1973).
Meteorological data rept.
Nov 73, 33p Rept no. DR-802

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, *Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Atmospheric motion, Humidity, Cloud cover, Tables(Data), Density, New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16101 Little John, Missile Numbers 3131/3117, Round Numbers 701 RO/702 RO, are presented in tabular form. (Author)

AD-776 905/2GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14102 RIP MISSILE NO. 10242, ROUND NO. 12 (14 NOVEMBER 1973).
Meteorological data rept.
Nov 73, 18p Rept no. DR-803

Descriptors: *Upper atmosphere, *Meteorological data, *Sounding rockets, *Impact prediction, Tables(Data), Elevation, Barometric pressure, Atmospheric temperature, Humidity, Dew point, Atmospheric density, Wind velocity, Wind direction, Cloud cover, Sounding rockets, Guided missile ranges, New Mexico.
Identifiers: Missile modification.

Meteorological data gathered for the launching of 14102 RIP, Missile Number 10242, Round Number 12, are presented in tabular form. (Author)

AD-776 906/0GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
16101 LITTLE JOHN MISSILE NO. 3113, ROUND NO. 703 RO (16 NOVEMBER 1973).
Meteorological data rept.
Nov 73, 18p Rept no. DR-804

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, *Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Atmospheric motion, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16101 Little John, Missile Number 3113, Round Number 703 RO, are presented in tabular form. (Author)

AD-776 907/8GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
03702 HONEST JOHN MISSILE NO. 1779, ROUND NO. 638 AML (26 NOVEMBER 1973).
Meteorological data rept.
26 Nov 73, 15p Rept no. DR-805

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, *Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Atmospheric motion, Humidity, Density, Cloud cover, Tables(Data), New Mexico.
Identifiers: Honest John.

Meteorological data gathered for the launching of 03702 Honest John, Missile Number 1779, Round Number 638 AML, are presented in tabular form. (Author)

AD-776 908/6GA PC$5.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
ATMOSPHERIC STRUCTURE, WHITE SANDS MISSILE RANGE, NEW MEXICO, PART 1. SURFACE WIND, CLOUD COVER, VISIBILITY.
Marjorie M. Hoidale, and Lamar Newman. Mar 74, 165p Rept no. DR-818
Supersedes AD-673 718.

Descriptors: *Meteorological data, *Guided missile ranges, *Atmospheres, Wind velocity, Cloud cover, Visibility, Statistical analysis, Ceiling, Gusts, Diurnal variations, Tables(Data), New Mexico.
Identifiers: White Sands Missile Range.

A statistical analysis of surface wind velocity, sky conditions, and visibility is presented for 'A' Station, White Sands Missile Range, New Mexico. This climatological information is based on the period of observation from 1951-1973. (Author)

AD-776 923/5GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
11602 LANCE MISSILE NO. 2118, ROUND NO. 211 RST.
Meteorological data rept.
Feb 74, 42p Rept no. DR-819

Descriptors: *Upper atmosphere, *Meteorological data, *Impact prediction, Sounding rockets, Tables(Data), Elevation, Barometric pressure, Atmospheric temperature, Humidity, Dew point, Atmospheric density, Wind velocity, Wind direction, Cloud cover, Guided missile ranges, New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 11602 Lance, Missile Number 2118, Round Number 211 RST, are presented in tabular form. (Author)

AD-776 924/3GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14102 RIP MISSILE NO. 10256, ROUND NO. 3.
Meteorological data rept.
2 Nov 73, 24p Rept no. DR-808

Descriptors: *Upper atmosphere, *Meteorological data, *Impact prediction, Sounding rockets, Elevation, Barometric pressure, Atmospheric temperature, Humidity, Dew point, Atmospheric density, Tables(Data), Wind velocity, Wind direction, Cloud cover, Guided missile ranges, New Mexico.
Identifiers: Missile modification.

Meteorological data gathered for the launching of 14102 RIP, Missile Number 10256, Round Number 3, are presented in tabular form. (Author)

AD-776 966/4GA PC$3.25/MF$1.45
New York Univ N Y Courant Inst of Mathematical Sciences
THE ZONALLY SYMMETRIC MOTION OF THE ATMOSPHERE,
Donald A. Drew. Aug 73, 36p Rept no. IMM-401
Grant DA-ARO-D-31-124-73-G150, ARPA Order-2069

Descriptors: *Atmospheric motion, Thermodynamics, Wind, Partial differential equations, Approximation, Turbulence, Coriolis effect, Jupiter(Planet), Planetary atmospheres.
Identifiers: Jupiter atmosphere.

The steady, zonally symmetric motion of a shallow incompressible atmosphere on a rapidly rotating earth subject to an equator-ward temperature gradient is studied. The assumptions made allow the thermodynamics to be treated separately from the motions. The turbulence terms are modelled using mixing length arguments. (Modified author abstract)

AD-776 975/3GA PC$3.75/MF$1.45
Glenn (A H) and Associates New Orleans La
WIND, WAVE, WATER LEVEL, AND ICE CONDITIONS AFFECTING DESIGN AND CONSTRUCTION OF THE PROPOSED LAKE ERIE INTERNATIONAL JETPORT, CLEVELAND, OHIO.
Final rept.
Mar 74, 64p AEWES-CR-H-74-1
Contract DACW39-73-C-0063

Descriptors: *Lakes, *Meteorological data, Wind, Lake waves, Level(Quantity), Storms, Ice, Airports, Feasibility studies, Ohio.
Identifiers: Lake Erie International Jetport, Cleveland(Ohio), *Lake Erie.

A wave hindcast for Lake Erie at Cleveland, Ohio, has been prepared using 10 years of recorded wind data from Burke Lakefront Airport supplemented by wind data from Cleveland Hopkins Airport. Average monthly and annual significant wave height, significant period, directional distribution, and percentage of occurrence are tabulated for stations located at latitude 41 degrees 39.0 minutes N, longitude 81 degrees 33.5 minutes W and latitude 41 degrees 38.2 minutes N, longitude 81 degrees 42.4 minutes W. The average monthly and annual wind speed direction regimes are provided for the first station. Normal winds, normal waves, normal (long duration) water levels, storm winds, storm (short duration) water levels, and storm wave characteristics are included in the report. The storm wave characteristics section summarizes the results of a storm wave height and period analysis at the stations for the 30 most severe storms occurring during the hindcast period and for the severe storms of November 1913 and November 1950. (Author)

AD-777 010/0GA PC$3.25/MF$1.45
University of Manchester Inst of Science and Technology (England) Dept of Physics
THE ROLE OF ELECTRICAL FORCES IN THE DEVELOPMENT AND DISSIPATION OF CLOUDS AND FOGS.
Final technical rept.,
John Latham, and M. H. Smith. Dec 73, 26p ERO-E-1430
Contract DAJA37-73-C-1623

Descriptors: *Weather modification, *Fog, *Cloud physics, Atmospheric electricity, Electric fields, Force(Mechanics), Drops, Coalescence, Feasibility studies, Great Britain.
Identifiers: *Fog dispersal.

The final report contains a description of some theoretical studies of the influence of evaporation and drop-interactions on a rainshaft, and an assessment, resulting from the experiments, of the feasibility of dispersing fogs by electrical forces. The fog dissipation experiments have demonstrated that the presence of high charges on drops greatly increases the rate at which they coalescence with smaller droplets, and so grow. Subject to satisfactory resolution of some engineering problems it appears, on the basis of these experiments, that the introduction of charged drops can possibly provide a feasible technique for the dispersion of quiescent warm fogs over airport runways. (Author)

AD-777 039/9GA PC$4.50/MF$1.46
Pacific Missile Range Point Mugu Calif
CLIMATIC HANDBOOK FOR POINT MUGU AND SAN NICOLAS ISLAND. PART I. SURFACE DATA.
Technical pub.,
Robert de Violini. 14 Mar 74, 121p Rept no. PMR-TP-74-1
Supersedes AD-822 824L. See also Part 2, AD-775 444.

Descriptors: *Climate, California, Meteorological data, Wind, Cloud cover, Visibility, Ceiling, Atmospheric temperature, Atmospheric precipitation, Barometric pressure, Solar radiation, Air pollution, Atmospheric electricity, Refractive index, Radar, Storms.
Identifiers: *Point Magu(California), *San Nicolas Island.

Surface climatic data relating to surface winds, sky cover, visibility, flying weather, temperature, relative humidity, precipitation, pressure, density, radar refraction, solar radiation, air contaminants, and atmospheric electricity are summarized in this handbook. In addition, brief station histories, comments on water and air temperatures over the Sea Test Range, tropical storm activity, and a glossary of terms are included. (Author)

AD-777 048/9GA PC$3.00/MF$1.45
Environmental Prediction Research Facility (Navy) Monterey Calif
SUMMARIES AND ABSTRACTS OF TROPICAL PUBLICATIONS OF THE NAVY WEATHER RESEARCH FACILITY AND ENVIRONMENTAL PREDICTION RESEARCH FACILITY, 1968 TO FEB 1974.
Technical note.
Mar 74, 22p Rept no. ENVPREDRSCHF-tech note-5-74

Descriptors: *Weather forecasting, *Tropical regions, Tropical cyclones, Typhoons, Abstracts, Reviews.

Tropical weather phenomena are of vital concern to naval operating forces in many regions of the world. For this reason, tropical meteorology is an important area of study at the Environmental Prediction Research Facility. The broad purpose of this research is to develop forecasting techniques for particular phenomena and/or specific regions as aids for the operational Navy environmentalist concerned with forecasting in tropical zones. The objective of this Technical Note is to make Navy forecasters or other interested environmentalists aware of the publications produced by this facility in the area of tropical meteorology.

AD-777 049/8GA PC$8.50/MF$1.45
National Climatic Center Asheville N C
SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS, WESTERN EUROPEAN COASTAL MARINE AREAS. VOLUME 6. AREA 31 - OSLOW, AREA 32 - COPENHAGEN, AREA 33 -BORNHOLM IS, AREA 34 - GULF OF DANZIG, AREA 35 - STOCKHOLM, AREA 36 - GULF OF RIGA.
Jan 74, 484p
Sponsored by Naval Weather Service Command, Washington, D.C. See also Volume 5 dated Jan 74, AD-776 396.

Descriptors: *Western Europe, *Marine meteorology, *Meteorological data, *Coastal regions, *Norway, *Sweden, *Denmark, Wind velocity, Cloud cover, Ceiling, Visibility, Humidity, Atmospheric temperature, Barometric pressure, Fog, Ocean waves, Air water interactions, Rainfall, Lightning, Dust, Tables(Data).
Identifiers: *Bornholm Island, *Danzig Gulf, *Riga Gulf, Oslo(Norway), Copenhagen(Denmark), Stockholm(Sweden).

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. Areas discussed include Oslo, Norway; Copenhagen, Denmark; Stockholm; Sweden; Bornholm Is.; the Gulf of Danzig and the Gulf of Riga.

BNL-18431 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
COMPARISON OF WIND SPEED AND TURBULENCE MEASUREMENTS MADE BY A HOT-FILM PROBE AND A BIVANE IN THE ATMOSPHERIC SURFACE LAYER.
S. SethuRaman, and R. M. Brown. 13p CONF-731205-4

Descriptors: (*Anemometers, *Performance), Calibration, Comparative evaluations, Operation.

For abstract, see NSA 29 07, number 15784.

COM-73-11362-83/GA PC$4.00
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY, MARCH 1973.
Jan 74, 90p KMRD-5.4-7303

Key to Meteorological Records Documentation.

Descriptors: *Cloud cover, *Spaceborne photography, Indexes(Documentation), Aerial photographs, Meteorological satellites.
Identifiers: NOAA 2 satellites.

The document contains photographs of cloud cover taken by the NOAA 2 satellite during March, 1973.

COM-73-11362-09/GA PC$4.00
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY, SEPTEMBER 1973.
Jan 74, 95p KMRD-5.4-7309
Key to Meteorological Records Documentation.

Descriptors: *Cloud cover, *Spaceborne photography, Indexes(Documentation), Aerial photographs, Meteorological satellite.
Identifiers: NOAA 2 satellite.

The document contains photographs of cloud cover taken by the NOAA 2 satellite during September, 1973.

COM-73-11362-10/GA PC$4.00
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY, OCTOBER 1973.
Jan 74, 98p KMRD-5.4-7310
Key to Meteorological Records Documentation.

Descriptors: *Cloud cover, *Spaceborne photography, Indexes(Documentation), Aerial photographs, Meteorological satellites.
Identifiers: NOAA 2 satellite.

The document contains photographs of cloud cover taken by the NOAA 2 satellite during October, 1973.

COM-73-11362-11/GA PC$4.00
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY, NOVEMBER 1973.
Jan 74, 95p KMRD-5.4-7311
Key to Meteorological Records Documentation.

Descriptors: *Cloud cover, *Spaceborne photography, Indexes(Documentation), Aerial photographs, Meteorological satellites.
Identifiers: NOAA 2 satellite.

The document contains photographs of cloud cover taken by the NOAA 2 satellite during November, 1973.

COM-73-50496-12/GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Rockville, Md.
MONTHLY WEATHER REVIEW. VOLUME 101, NUMBER 12. DECEMBER 1973.
Monthly rept.,
Harold A. Corzine. Dec 73, 91p NOAA-74021301
Paper copy available from GPO $19.00/year as C55.11:101, $1.75/copy as C55.11:101/12.

Descriptors: *Weather forecasting, *Periodicals, Tropical atmospheres, Atmospheric circulation, Eddies, Thunderstorms, Monsoons, Rainfall, Gamma function, Cloud cover, Snowstorms.
Identifiers: Numerical weather forecasting.

In addition to its usual features, articles, picture of the month, and weather and circulation (monthly), this issue contains a table of contents and index for the 1973 volume.

COM-73-50496-12-01/GA
(Order as COM-73-50496-12)
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
CUMULUS CONVECTION AND LARGER SCALE CIRCULATIONS. I. BROADSCALE AND MESOSCALE CONSIDERATIONS,
William M. Gray. 29 Sep 73, 18p NOAA-74021301-1
Sponsored in part by National Science Foundation, Washington, D.C. Revision of report dated 22 Sep 72.
Included in Monthly Weather Review, v101 n12 p839-855 Dec 73, COM-73-50496-12.

Descriptors: *Tropical atmospheres, *Atmospheric circulation, *Cumulus clouds, Convection, Heat transfer, Momentum transfer, Water vapor, Cloud physics.

The paper (part I) is a discussion of the magnitude and implication of the vertical circulation patterns of the summertime tropical atmosphere as derived from synoptic scale considerations. Part I is compared to the vertical circulation patterns derived from cumulus scale considerations as discussed by Lopez in part II, a companion paper. From the synoptic scale considerations, the authors show that a very significant subsynoptic or local vertical motion is occurring within the cloud regions of the Tropics. (Modified author abstract)

COM-73-50496-12-02/GA
(Order as COM-73-50496-12)
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
CUMULUS CONVECTION AND LARGER SCALE CIRCULATIONS. II. CUMULUS AND MESOSCALE INTERACTIONS,
Raul Erlando Lopez. 29 Sep 73, 16p NOAA-74021301-2
Revision of report dated 22 Sep 72.
Included in Monthly Weather Review, v101 n12 p856-870 Dec 73, COM-73-50496-12.

Descriptors: *Tropical atmospheres, *Atmospheric circulation, *Cumulus clouds, Mathematical models, Convection, Heat transfer, Cloud physics.

The paper is the second of two papers dealing with cumulus and broader scale flow interaction. The first is a companion paper that deals with this topic from broad-scale considerations. The second deals with this topic from the cumulus scale point of view. A numerical model of individual convective clouds has been used to investigate the effects of a typical population of cumulus clouds on the large-scale features of a tropical disturbance or cloud cluster. The typical cloud population has been determined from U.S. Navy aircraft reconnaissance radar data in the tropical Atlantic Ocean. This study shows that the detrainment of cloud mass from the population produces net cooling of the air around the clouds. (Modified author abstract)

COM-73-50496-12-03/GA
(Order as COM-73-50496-12)
National Meteorological Center, Washington, D.C.
A VERTICALLY INTEGRATED PRIMITIVE-EQUATION MODEL,
Joseph Sela, and William J. Bostelman. 16 Oct 73, 7p NOAA-74021301-3
Revision of report dated 10 Apr 73.
Included in Monthly Weather Review, v101 n12 p871-876 Dec 73, COM-73-50496-12.

Descriptors: *Weather forecasting, *Eddies, Topography, Heating, Numerical analysis.
Identifiers: *Numerical weather forecasting, Primitive equations.

The primitive equations are integrated with respect to the vertical coordinate, sigma. The resulting equations contain vertical eddy terms arising from non-linearities. These eddies are parameterized using a standard-atmosphere temperature distribution and a linear jet wind profile independent of horizontal position. The model includes topography and is capable of responding to diabatic heating. Experiments with and without the continuity equation are carried out, and a comparison is made with barotropic forecasts. Exclusion of the mass continuity condition results in superior forecasts, especially near high terrain. (Author)

COM-73-50496-12-04/GA
(Order as COM-73-50496-12)
Utah Univ., Salt Lake City. Dept. of Meteorology.
CORRELATION OF NOCTURNAL THUNDERSTORMS AND BOUNDARY-LAYER CONVERGENCE,
Jan Paegle, and David W. McLawhorn. 12 Oct 73, 8p NOAA-74021301-4
Grant NSF-GA-28277
Revision of report dated 27 Apr 73.
Included in Monthly Weather Review, v101 n12 p877-883 Dec 73, COM-73-50496-12.

Descriptors: *Thunderstorms, *Boundary layer flow, Correlation techniques, Mathematical models, Night, Great Plains, Weather forecasting.

An analysis is made of 11 Great Plains nocturnal thunderstorm occurrences that have no obvious synoptic scale support. The pressure patterns and local terrain configurations are input to a numerical boundary-layer model that computes the vertically integrated boundary-layer convergence. The time and space phasing of the vertical velocities thus obtained are in good agreement with the time and space phasing of all 11 thunderstorm occurrences for the beginning of the activity, but they are acceptable in only 6 cases for the termination of the activity. There is a tendency for the model for forecast boundary-layer convergence where no thunderstorms occur; but in many such cases, stability and humidity data are unfavorable for thunderstorm activity. (Author)

COM-73-50496-12-05/GA
(Order as COM-73-50496-12)
Institute of Tropical Meteorology, Poona (India).
AN ESTIMATE OF THE DISTRIBUTION AND STABILITY PERIOD OF THE PARAMETERS OF THE GAMMA PROBABILITY MODEL APPLIED TO MONTHLY RAINFALL OVER SOUTHEAST ASIA DURING THE SUMMER MONSOON,
Diwakar A. Mooley. 8 Aug 73, 8p NOAA-74021301-5
Revision of report dated 17 May 72.
Included in Monthly Weather Review, v101 n12 p884-890 Dec 73, COM-73-50496-12).

Descriptors: *Southeast Asia, *Monsoons, *Rainfall, *Weather forecasting, India, Gamma function, Beta function, Probability density functions.

Following the Monte Carlo technique, the authors have obtained an estimate of the period of monthly rainfall that would provide approximate normality for the marginal distributions of the shape and scale parameters of the gamma model applied to monthly rainfall and an estimate of the stability period of these parameters. The long rainfall records (exceeding 130 yr) of Bombay, Calcutta, and Madras were used. These three stations in India are from three distinctly different rainfall regimes during the summer monsoon. The marginal distributions of the shape and scale parameters appear to attain approximate normality when the period of monthly data approaches 75 yr. The stability period of the gamma model parameters (based on the specific criterion adopted) appears to be from 50 to 65 yr. (Author)

COM-73-50496-12-06/GA
(Order as COM-73-50496-12)
Georgia Univ., Athens. Office of Computer Activities.

NOTE ON THE SAMPLE SIZE TO ACHIEVE NORMALITY FOR ESTIMATORS FOR THE GAMMA DISTRIBUTION,
L. R. Shenton, and K. O. Bowman. 25 Sep 72, 3p NOAA-74021301-6
Sponsored in part by Department of Defense and Atomic Energy Commission, Washington, D.C. Prepared in cooperation with Oak Ridge National Lab., Tenn.
Included in Monthly Weather Review, v101 n12 p891-892 Dec 73, COM-73-50496-12.

Descriptors: *Weather forecasting, *Gamma function, *Sampling, Beta function, Estimates.
Identifiers: Maximum likelihood estimation.

The two-parameter gamma distribution is determined by its shape parameter Gamma and scale parameter, Beta. Maximum likelihood estimators of these Gamma/gamma, Beta/beta are distributed independent of Beta and tend to be normally distributed as the sample size n increases. Values of n are given (for selected values of Gamma) to ensure near normality. (Author)

COM-73-50496-12-07/GA
(Order as COM-73-50496-12)
Freie Universitaet Berlin (West Germany). Institut fuer Meteorologie und Geophysik.
COMPARISON OF MEAN CLOUD COVER OBTAINED BY SATELLITE PHOTOGRAPHS AND GROUND-BASED OBSERVATIONS OVER EUROPE AND THE ATLANTIC,
Horst Malberg. 29 Aug 73, 6p NOAA-74021301-7
Revision of report dated 22 May 73.
Included in Monthly Weather Review, v101 n12 p893-897 Dec 73, COM-73-50496-12.

Descriptors: *Cloud cover, *Europe, *Atlantic Ocean, Ground based detectors, Meteorological satellites, Spaceborne photography, Comparison, West Germany.
Identifiers: ESSA 8 satellite.

An important field of weather observation is the statement of cloud cover of the sky. Clouds not only are significant for the daily weather forecast but also are important for energetic calculations of atmospheric processes. A milestone in monitoring of large-scale cloudiness is the application of weather satellites. With the daily pictures from ESSA 8, estimations of the cloud cover in tenths for geographical 2.5 degree sections have been made for a period of 3 yr (Dec 1, 1967-Nov 30, 1970), and the mean seasonal cloud distribution over Europe and the Atlantic has been calculated. Twenty-nine synoptic stations have been used for comparison between satellite and surface observations. (Modified author abstract)

COM-73-50496-12-08/GA
(Order as COM-73-50496-12)
National Environmental Satellite Service, Kansas City, Mo. Satellite Field Services Station.
PICTURE OF THE MONTH. AUTUMN SNOW STORMS IN THE PLAINS,
Terry R. Schoeni. 1973, 4p NOAA-74021301-8
Revision of report dated 22 May 73.
Included in Monthly Weather Review, v101 n12 p898-900 Dec 73, COM-73-50496-12.

Descriptors: *Snowstorms, *Great Plains, *Aerial photographs, Cloud cover, Spaceborne photography, Meteorological satellites.
Identifiers: ATS-3 satellite.

Two snow situations that occurred in the Great Plains during the fall of 1972 are depicted. One produced a typical, narrow but heavy snow band and the other an unusually widespread, but light snow cover. One ATS-3 picture shows the snowband and satellite observations on subsequent cloud-free days enables the River Forecast Center to determine the area of remaining snow cover and added reliability to their snow melt calculations. The effect of snow cover is discussed. The second, widespread but light, snowfall resulted from an upper level trough sweeping across the Great Plains. Snow amounts were generally less than 2 in. The ATS-3 picture shows an unusually large area of snow cover for early December. This snow cover stretches from the Canadian border southward into Oklahoma and Missouri. The bands of snow oriented northeast-southwest in Kansas and Missouri indicate areas of varying amounts of snow cover. This pattern shows the path of the convective activity that produced the snow.

COM-73-50496-12-09/GA
(Order as COM-73-50496-12)
National Meteorological Center, Washington, D.C.
WEATHER AND CIRCULATION OF SEPTEMBER 1973. RECORD SEPTEMBER PRECIPITATION IN THE GREAT PLAINS AND ROCKY MOUNTAINS,
Robert E. Taubensee. 1973, 7p NOAA-74021301-9
Included in Monthly Weather Review, v101 n12 p901-906 Dec 73, COM-73-50496-12.

Descriptors: *Atmospheric circulation, *Northern hemisphere, Weather, Atmospheric temperature, Precipitation(Meteorology).

The mean 700-mb circulation over the Northern Hemisphere in September 1973 was characterized by three prominent amplified waves over middle and higher latitudes. Details are given on weekly variability and tropical activity.

COM-74-10585/9GA PC$6.25/MF$1.45
National Weather Service, Silver Spring, Md. Climatological Services Div.
RELATIONS BETWEEN GAMMA FUNCTION PARAMETERS AND CLIMATIC VARIATION IN TENNESSEE.
Technical memo.,
Henry A. Fribourg, Rodney H. Strand, John V. Vaiksnoras, and William L. Sanders. Nov 73, 64p NOAA-TM-NWS-CLIMAT-2 NOAA-74021304
Prepared in cooperation with Tennessee Univ., Knoxville, and Oak Ridge National Laboratory, Tenn.

Descriptors: *Climate, *Tennessee, *Gamma function, *Precipitation(Meteorology), Seasonal variations, Probability density functions.

The use of the incomplete gamma probability density function for computing the probability of weekly precipitation amounts is discussed. Geographic variation of 1-, 2- and 3-week mean gamma function parameters over the state of Tennessee is compared with the variation in precipitation amount. It is concluded that the function is a satisfactory tool for developing precipitation probabilities, since the empirical parameters are responsive to seasonal and geographic variation. (Author)

COM-74-10598/2GA PC$4.25/MF$1.45
Chicago Univ., Ill. Dept. of the Geophysical Sciences.
FURTHER STUDIES OF THE PARAMETERIZATION OF THE INFLUENCE OF CUMULUS CONVECTION ON LARGE-SCALE FLOW.
Final rept.,
H. L. Kuo. Jul 73, 21p Planetary Circulation-19 NOAA-74021310
Grant NOAA-N22-154-72(G)

Descriptors: *Cumulus clouds, *Heat transfer, Convection, Latent heat, Equations of motion.

The parameterization scheme devised by the author in an earlier study (Kuo, 1965) is re-derived on a rigorous basis and extended so as to include the sensible heat transfer. It is shown that both the amount and the vertical distribution of the latent heat released and the sensible heat transported by the deep cumulus towers can be represented by the temperature difference between the cloud and the environment and the moisture convergence produced by the large-scale flow. The often stressed mechanism of heating by compression in the descending regions is automatically taken into consideration in this formulation. On the other hand, the transport of heat by the shallow cumulus unrelated to the large-scale flow can be calculated in terms of the heat flux and other parameters in the well-mixed surface layer by the use of a simple, horizontally integrated convection model. (Author)

COM-74-10603/0GA PC$4.00/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.
SUBSYNOPTIC CONVERGENCE-RAINFALL RELATIONSHIPS BASED UPON 1971 SOUTH FLORIDA DATA.
Technical memo.,
Jose J. Fernandez-Partagas. Nov 73, 81p NOAA-TM-ERL-WMPO-9 NOAA-74021305

Descriptors: *Thunderstorms, *Rainfall, Convection, Heat transfer, Forecasting, Florida.

Convergence-rainfall relationships are studied at subsynoptic scales of motion in relation to Florida convection. These relationships are based upon analyses of three selected thunderstorm cases. Analyses make use of radar and numerous surface wind and rainfall observations which were taken to the south of Lake Okeechobee, Florida, during the summer of 1971. The evolution of convergence, relative vorticity and rainfall is examined at the cloud-scale and at the meso-scale. Convergence-rainfall relationships at these two scales - together with those found for the Florida peninsula ('larger scale') - show the relation which links surface convergences and divergences at different scales with peak rainfall. Maximum surface convergence occurs first at the 'larger scale' and it is followed by corresponding maxima at the meso-scale and then at the cloud-scale. After peak rainfall, maximum surface divergence occurs first at the cloud-scale and is followed by meso-scale and then by 'larger scale' surface divergences. The findings of this study are discussed in relation to the parameterization and short-range forecasting of convective rainfall. (Author)

COM-74-10695/6GA PC$4.00/MF$1.45
Oklahoma Univ., Norman. Dept. of Meteorology.
VARIATIONAL METHOD AIMING OPERATIONAL APPLICATION TO ANALYSIS AND SHORT RANGE PREDICTION OF LOCAL SEVERE WEATHER.
Final rept. Oct 72-Sep 73,
Yoshikazu Sasaki. Jan 74, 20p NOAA-74022604
Grant NOAA-043-022-9
Prepared in cooperation with Office of Research Administration, Norman, Okla.

Descriptors: *Weather forecasting, *Storms, Mathematical prediction, Tornadoes, Wind(Meteorology), Atmospheric temperature, Time series analysis.
Identifiers: Short range weather forecasting, Variational methods.

Research conducted during the period October 1, 1972 through September 31, 1973 is summarized in the final report. The primary objective of the project was to investigate operational schemes of analysis and short range prediction of local severe weather. Among the studies reported were the following: variational analysis of moisture convergence, vertical velocity, fluxes and energy budget; tornadic storm forecasting technique; the application of low-pass and band-pass filtering techniques to surface and upper air wind fields; environmental energy fields associated with severe storms; an experiment of subjective tornadic storm forecasting using hourly surface observations; temperature and wind variations at the WKY-TV Tower; and mechanism of squall-line formation as suggested from variational analysis of hourly surface observations.

COM-74-10718/6GA PC$4.75/MF$1.45
National Oceanic and Atmospheric Administration, Washington, D.C. Federal Coordinator for Meteorological Services and Supporting Research.
FEDERAL PLAN FOR NATIONAL CLIMATIC SERVICES.
Jan 74, 34p FCM-74-1 NOAA-74030418

Descriptors: *Climatology, *Government policies, Weather forecasting, Weather stations, Data acquisition, Quality control, Information centers.

National climatic services of the Department of Commerce, Department of Defense, other government agencies and the World Meteorological Centers are briefly described. Information is given on the various climatological programs concerned with data acquisition, quality control, and data processing and archiving. New user requirements and service deficiencies are considered in relation to user needs, data acquisition deficiencies as well as quality control deficiencies. Finally methods and plans for improving climatic services are set forth.

COM-74-10719/4GA PC$6.75/MF$1.45
National Weather Service, Silver Spring, Md. Techniques Development Lab.
FORECASTING EXTRATROPICAL STORM SURGES FOR THE NORTHEAST COAST OF THE UNITED STATES.
Technical memo.,
N. Arthur Pore, William S. Richardson, and Herman P. Perrotti. Jan 74, 74p NOAA-TM-NWS-TDL-50 NOAA-74030402

Descriptors: *Weather forecasting, *Storm surges, Tropical storms, Coasts, United States, North Atlantic Ocean, Ocean tides, Wind(Meteorology), Atmospheric pressure, Empirical equations.

The National Weather Service (NWS) has developed a technique for forecasting extratropical storm surges along the northeast coast of the United States. The storm surge is caused mainly by the strong winds associated with extratropical storms over nearshore areas. Empirical forecast equations have been derived for 10 locations from Portland, Maine to Norfolk, Va. with data from 68 storms that occurred from 1956 through 1969. Input data to the technique are sea-level pressure values as forecast by the Primitive Equation (PE) model of the National Meteorological Center (NMC). Two versions of the method are available--an automated one that uses input data directly from the PE model and a manual one that can be used at forecast offices and depends on pressure forecasts from any source. Experience has emphasized the importance of accurate input sea-level pressure forecasts. Indications are that the system is useful. Plans are to expand it to include other locations. (Author)

COM-74-10732/7GA PC$5.75/MF$1.45
International Hydrological Decade, Ottawa (Ontario). Canadian National Committee.
U.S. IFYGL PRECIPITATION DATA ACQUISITION SYSTEM.
Technical manual series,
Arthur L. Hansen, James W. Wilson, Carl F. Jenkins, and Loran A. Weaver. Dec 73, 53p IFYGL-TMS-4 NOAA-74022602

Descriptors: *Precipitation(Meteorology), *Meteorological data, *Data acquisition, Meteorological radar, Rain gages, Snowmelt, Networks, Data processing, Great Lakes, Canada, New York.

The Precipitation Data Acquisition System described in this report was planned as an integral part of the total IFYGL field program and was designed to provide data for several users, primarily, the Terrestrial Water Budget Panel and the Lake Meteorology Panel. This report deals only with the United States portion of the total IFYGL precipitation system. Its purpose is to document the system in terms of design, operation, maintenance, and data characteristics to provide background for users of the data. Also discussed are system performance and costs so that future field programs can benefit from the IFYGL experience.

COM-74-50230/3GA PC-GPO/MF$1.45-NTIS
National Environmental Satellite Service, Washington, D.C.
VERTICAL RESOLUTION OF TEMPERATURE PROFILES FOR HIGH RESOLUTION INFRARED RADIATION SOUNDER (HIRS).
Technical rept.,
Y. M. Chen, H. M. Woolf, and W. L. Smith. Jan 74, 19p NOAA-TR-NESS-67 NOAA-74021904
Paper copy available from GPO $0.55 as C55.13:NESS67.

Descriptors: *Remote sensing, *Atmospheric temperature, Atmospheric sounding, Infrared detection, Meteorological satellites.
Identifiers: Nimbus F satellite.

By using the method of Backus and Gilber, the intrinsic vertical resolution of temperature profiles obtained from the High Resolution Infrared Radiation Sounder (HIRS) on the Nimbus-F satellite, which contains channels in both 4.3-micrometers and 15-micrometers CO2 absorption bands, is evaluated and compared with those of channels in the 4.3-micrometer band and the 15-micrometer band alone. It is found that the combination of 4.3-micrometer and 15-micrometer bands is superior to the other two cases for all levels of the pressure. (Author)

COM-74-50237/8GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.
LIGHTNING SUPPRESSION BY CHAFF SEEDING.
Technical rept.,
Heinz W. Kasemir. Nov 73, 35p NOAA-TR-ERL-284, APCL-30 NOAA-74020604

Descriptors: *Thunderstorms, *Cloud seeding, Lightning, Chaff, Electric corona, Electric discharges, Conductivity.
Identifiers: *Lightning suppression.

The basic concept of lightning suppression by chaff seeding is to increase the conductivity inside a thunderstorm by a continuous release of ions liberated through corona discharge on chaff fibers which are dispersed from an airplane inside the cloud. This increased conductivity would permit the current produced by the thunderstorm to flow from the positive to the negative charge center or from the negative charge center to the ground without the generation of the high electric fields which are necessary to initiate lightning discharges. The application of this simple concept to modify the electric field or the lightning activity of a real thunderstorm encounters a number of questions on the theoretical as well as on the practical side that are difficult to answer. These and other problems are discussed in detail in this report. Finally, the first results on an accelerated field decay caused by chaff seeding underneath a thunderstorm are presented. (Modified author abstract)

COM-74-50273/3GA PC-GPO/MF$1.45-NTIS
Naval Weather Service Command, Washington, D.C.
WORLDWIDE MARINE WEATHER BROADCASTS: SECTION 1. RADIOTELEGRAPH AND RADIOTELEPHONE BROADCASTS. SECTION 2. VHF-FM CONTINUOUS WEATHER BROADCASTS. SECTION 3. RADIOFACSIMILE BROADCASTS.
Sep 73, 132p NOAA-74030403
Paper copy available from GPO $1.45 as stock no. 0317-00147.

Descriptors: *Weather communication, *Radio broadcasting, Radio stations, Global communications, Radiotelegraphy, Radio telephones, Radio facsimile systems, Voice communication, Handbooks.

This booklet was formerly entitled 'Weather Service for Merchant Shipping.' Section 1 lists the details of all U.S. and selected foreign radio stations that transmit scheduled radiotelegraph and radiotelephone weather broadcasts. Also included in this section is the Radio WLO, Mobile, Ala., radiotelegraph broadcast. A listing of weather broadcasts by U.S. radio stations on the Great Lakes precedes the pages for the North Atlantic. Section 2 contains details of U.S. and foreign radiofacsimile weather chart transmissions that would be useful to ships equipped to receive them. Section 3 lists the VHF-FM continuous voice weather broadcasts within the United States. These broadcasts may be of great value to ships entering and departing port.

JPRS-61362 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
WEATHER FORECASTING,
G. Marchuk. 1 Mar 74, 14p
Trans. of Nauka i Zhizn (USSR) n11 p10-15 Nov 73.

Descriptors: *Weather forecasting, USSR, Translations, Meteorological data.

The report contains a description of weather forecasting methods.

N74-17329/5GA PC$3.00/MF$1.45
Swiss Inst. of Meteorology, Zurich.
FOEHN OF VALAIS LE FOEHN DU VALAIS.
M. Boueet. 1972, 13p
In French; English Summary.

Descriptors: *Atmospheric circulation, *Atmospheric temperature, *Mountains, *Switzerland, Wind direction, Wind variations, Wind velocity measurement.

For abstract, see STAR 1208

N74-17330/3GA PC$5.00/MF$1.45
Weapons Research Establishment, Salisbury (Australia).
MEASUREMENTS OF THE BASIC ATMOSPHERIC PARAMETERS AT WOOMERA USING THE FALLING SPHERE, JULY - DECEMBER 1972.
P. H. O. Pearson. Aug 73, 59p WRE-TN-1002(WR/D)

Descriptors: *Atmospheric models, *Falling spheres, *Meteorological parameters, Atmospheric density, Atmospheric pressure, Atmospheric temperature, Wind (Meteorology).

For abstract, see STAR 1208

N74-17358/4GA PC$4.00/MF$1.45
Direction de la Meteorologie Nationale, Paris (France). Centre Meteorologique Regional de Marignane.
NORTH-WEST WINDS AND THE 'MISTRAL' AT MARSEILLE FROM 1882 TO 1970 (STATISTICAL TEST) VENTS DE NORD-OUEST ET MISTRAL A MARSEILLE DE 1882 A 1970 (ESSAI STATISTIQUE).
C. Bordreuil, A. Barbia, and P. Comte. Sep 73, 38p MONO-88
Language in French.

Descriptors: *Annual variations, *Wind variations, Atmospheric circulation, France, Statistical analysis, Synoptic meteorology, Wind direction, Wind velocity.

For abstract, see STAR 1208

N74-17362/6GA PC$5.25/MF$1.45
Direction de la Meteorologie Nationale, Paris (France). Service Meteorologique de Polynesie Francaise.
CLIMATOLOGY OF THE AIRPORT OF TAHITI-FAAA CLIMATOLOGIE DE L'AEROPORT DE TAHITI-FAAA.
G. Cauchard, R. Leymarie, J. Bacara, and R. Magniez. Aug 73, 61p MONO-87
Language in French.

Descriptors: *Airports, *Climatology, *Pacific islands, Meteorological charts, Meteorological parameters, Profiles, Tables (Data), Weather stations.

For abstract, see STAR 1208

N74-17366/7GA PC$4.00/MF$1.45
Stockholm Univ. (Sweden). Inst. of Meteorology.
ON INITIALIZATION FOR MODELS USING SIGMA AS VERTICAL COORDINATE.
H. Sundqvist. Oct 73, 17p DM-10
Contracts SWEDSRC-G-2753-4, SWEDSRC-G-0223-058

Descriptors: *Atmospheric models, *Numerical weather forecasting, *Vertical distribution, Coordinates, Divergence, Equations of motion, Numerical integration, Wind profiles.

For abstract, see STAR 1208

PB-230 325/3GA PC$5.75/MF$1.45
Illinois State Water Survey, Urbana.
STUDY OF URBAN EFFECTS ON PRECIPITATION AND SEVERE WEATHER AT ST. LOUIS.
Annual rept. Mar 72-Feb 73,
Stanley A. Changnon, Jr. Apr 73, 54p ISWS-73-CON-138
Grant NSF-GI-33371

Descriptors: *Climatology, *Urban areas, *Missouri, Precipitation(Meterology), Storms, Atmospheric circulation, Air pollution, Weather modification, Climatic changes.
Identifiers: St. Louis(Missouri), Inadvertent weather modification, Urban heat islands.

The activities and results reported upon in this report represent those resulting from the second year of a 2-year project. The general goal of the Water Survey program involving METROMEX (METROpolitan Meteorological EXperiment) consists of the delineation of any anomalies in the precipitation and severe weather patterns and frequencies in St. Louis and environs, the quantification of the causes for any such anomalies, investigations of the revelance of these findings to the local area and to other urban-agricultural areas of Illinois, and the transmission of these findings to potential users in the scientific community and to the public of Illinois. New activities largely concerned(1) a sizeable increase in instruments to define better precipitation; (2) more instrumentation was added to better define temperature and the humidity patterns of the surface (3) field operations and analysis pertaining to the airflow and urban circulation; and (4) the external application for transmission of results to users.

PB-230 378/2GA PC$5.00/MF$1.45
Washington Univ., Seattle. Div. of Marine Resources.
ARCTIC ICE DYNAMICS JOINT EXPERIMENT. AIDJEX BULLETIN.
Jan 74, 163p AIDJEX-Bull-23
Grant NSF-C625
See also PB-224 513.

Descriptors: *Sea ice, *Pack ice, *Arctic regions, Meteorological data, Heat transfer, Drift stations, Oceanographic data.

AIDJEX Bulletin No. 23 contains reports on the continuing work of the AIDJEX numerical modeling group. Papers deal with such subjects as the energetics of pressure ridging, the theory of sea-ice movement, the roughness parameter of sea ice, the mechanics of rafting, and similarity constants in the planetary boundary layer. An analysis, by Hunkins, of oceanographic data from the 1972 AIDJEX Pilot Study is also included, as well as a scheme by Hibler, Mock, and Tucker for classifying the regional and seasonal variations of ridges. Finally there is a description of the AIDJEX Lead Experiment, a program of atmospheric and oceanic observations at a newly created lead which will be conducted offshore from Barrow, Alaska during March and April 1974.

PB-230 695/9GA PC$4.00/MF$1.45
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
SENSITIVITY ANALYSIS OF A THUNDERSTORM RAINFALL MODEL,
James R. Wallace, and Kwei-Lin L. Wang. Jan 74, 85p ERC-0374 W74-06101, OWRR-A-036-GA(2)
Contract DI-14-31-0001-3810

Descriptors: *Thunderstorms, *Rainfall, *Computerized simulation, *Georgia, Stochastic processes, Digital simulation, Coasts.

In a sensitivity analysis of a previously developed digital model for the stochastic simulation of thunderstorm rainfall, patterns of rainfall were generated for each of several combinations of some key parameters of the model. Statistics based on the depth, duration, and intensity of the rainfall were computed from a set of generated storms and compared with similar statistics computed from another set of storms generated after one of the model parameters had been changed by a predetermined amount. The parameters studied included (1) the parameter which establishes the spatial distribution of rainfall intensity within the thunderstorm cell, (2) the cell duration, and (3) the maximum size attained by the cell. The model is capable of reproducing the rainfall characteristics as measured in the field; however, it is recommended that the same parameter values not be used, unless they can be varified with local data, to generate thunderstorm rainfall for localities where rainfall characteristics are likely to differ significantly from those in the Georgia Coastal Plains. (Modified author abstract)

RT/PROT-(73)10 PC$5.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
METEOROLOGICAL MEASUREMENTS IN THE LOWER STRATA AND THEIR INTERPRETATION IN THE STUDY OF ATMOSPHERIC DIFFUSION AT THE BRASIMONE SITE. FIRST REPORT.
P. Cagnetti, S. Palmieri, and G. Simonini. 6 Apr 73, 70p
In Italian. U.S. Sales Only.

Descriptors: (*Pec brasimone reactor, *Meteorology), Diffusion, Italy, Particles, Reactor sites, Seasonal variations, Surface air.

For abstract, see NSA 29 07, number 15664.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-776 305/5GA PC$4.75/MF$1.45
Naval Postgraduate School Monterey Calif
SINGLE-PERIOD STOCHASTIC INVENTORY PROBLEMS WITH QUADRATIC COSTS.
Master's thesis,
Moon Ho Song. Mar 74, 35p

Descriptors: *Inventory control, *Stochastic processes, Decision making, Probability density functions, Costs, Optimization, Theses.

Single-period inventory problems such as the newspaper boy problem having quadratic cost functions for either or both shortages and overages are examined to determine the optimal order level under various principles of choice such as minimum expected cost, aspiration level, and minimax regret. Procedures for finding the optimum order levels are developed for both continuous and discrete demand patterns. (Author)

COM-74-10584-03/GA
(Order as COM-74-10584)
Rhode Island Univ., Kingston.
ORGANIZING NEW ENGLAND COMMERCIAL FISHERMEN AT THE REGIONAL LEVEL,
W. H. MacKenzie. 1973, 20p NOAA-74020701-3
Included in Marine Affairs Jnl., n1 p33-51, Dec 73.

Descriptors: *Fisheries, *Organizations, *New England, Trade associations.
Identifiers: Sea Grant program.

New England commercial fishermen are organizing to resolve problems among themselves and to influence fishery-related decisions at all levels of government. This study details the formation, growth, and operating procedures of two regional New England efforts. The two regional groups are identified as: The Atlantic Offshore Fish and Lobster Association and the New England Fisheries Steering Committee.

N74-17667/8GA PC$4.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A CONTEMPORARY VIEW OF SYSTEMS ENGINEERING.
R. F. Miles, Jr.. 15 Jan 74, 23p NASA-CR-136833, JPL-TM-33-667
Contract NAS7-100

Descriptors: *Systems engineering, *Systems management, Aerospace engineering, Budgeting, Data processing, Information management, Operations research.

For abstract, see STAR 1208

PATENT-3 238 652 Not available NTIS
Department of the Interior, Washington, D.C.
MECHANICAL PROGRAMMING DEVICE.
Patent,
Bruce M. Eaton. Filed 31 Dec 63, patented 8 Mar 66, 5p PAT-APPL-334 951, DOCKET/RCE-586
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Mechanical computers, *Patents, Scheduling, Personnel management, Manpower utilization, Information.
Identifiers: PAT-CL-40-68.

The patent relates to an indicator mechanism on which a display of complex data can be conveniently varied as required by changes desired in a programmed procedure involving such data. It has particular utility in furnishing a useful record of work assignment information needed for managing an installation whereat a continuous and substantially uniform plan of operations is ordinarily maintained.

PB-229 892/5GA PC$4.00/MF$1.45
Urban Inst., Washington, D.C.
HOUSING SUBSIDIES AS REDISTRIBUTIVE INSTRUMENTS.
Working paper,
Harold M. Hochman. Jun 73, 19p UI-116-90 HUD-PDR-007-a
Contract HUD-H-2114
Paper 31 on National Housing Policy Study Papers. Background Studies. Volume 3.

Descriptors: *Housing studies, *Subsidy programs, *Income redistribution, *Reviews, Validi-

ty, Objectives, Evaluation, Analyzing, Effectiveness.
Identifiers: *Housing and urban development research, Housing subsidies.

The paper sets out and evaluates the logic of housing subsidies as instruments of income redistribution from rich to poor. The focus of the study is on the legitimacy of housing subsidies as a means of redistributing income, where redistribution is desired for its own sake, and for its effects on recipients and their communities. Desirable effects of housing subsidies which might occur whether or not they redistribute income are neither considered nor denied.

5B. Documentation and Information Technology

AD-776 299/0GA PC$5.00/MF$1.45
Dayton Univ Ohio Research Inst
OPTIMIZATION OF RETRIEVAL TECHNIQUES AND FILE STRUCTURES FOR THE CIRCOL (CENTRAL INFORMATION REFERENCE AND CONTROL ON-LINE) SYSTEM.
Final rept. 1 Jul 72-31 Aug 73,
Frederic L. Scheffler. Feb 74, 151p Rept no. UDRI-TR-73-53 RADC-TR-73-420
Contract F30602-72-C-0305

Descriptors: *Information retrieval, *Intelligence, Data management, Indexing, Natural language, Algorithms, On line systems, Reaction time.
Identifiers: *Search structuring, Evaluation, CIRCOL(Central Information Reference and Control On-Line Systems), Central information reference and control on-line systems.

The Central Information Reference and Control On-Line (CIRCOL) System is a computer-based document reference retrieval system maintained by the Foreign Technology Division (FTD) in support of Scientific/Technical intelligence production. CIRCOL System performance was analyzed by systematically studying the effects of twelve primary factors on search response time. Included in the report is a study of the use of CIRCOL by four types of users, recommendations on how to optimize file structures and system processing, and an investigation of the IBM Storage and Information Retrieval System (STAIRS) was made with respect to its suitability to the CIRCOL System. (Modified author abstract)

AD-776 600/9GA PC$3.00/MF$1.45
Defense Documentation Center Alexandria Va
ANNUAL REPORT, 1 JULY 1972-30 JUNE 1973.
Aug 73, 23p Rept no. DDC-TR-73-3

Descriptors: *Technical information centers, *Data banks, *Military publications, Data management, Information retrieval, Data processing, Management information systems, Military research, Management planning and control, Reviews, Reports.
Identifiers: *DDC(Defense Documentation Center), Defense Documentation Center.

The report describes the more significant activities and achievements of the Defense Documentation Center during FY 73. The information presented should be of particular interest to the organizations that make frequent use of the products and services of the Defense Documentation Center. (Author)

AD-776 642/1GA PC$4.50/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
SEMI AUTOMATIC INDEXING - STATE OF THE ART.
AGARDograph rept.,
H. Fangmeyer. Feb 74, 26p Rept no. AGARD-AG-179
NATO furnished.

Descriptors: *Subject indexing, Automation, Information processing, Computer applications, Man machine systems, State of the art, Reviews.
Identifiers: Automatic indexing.

Contents:
- Semi-automatic indexing techniques;
- Primary or internal index production (derivative indexing);
- Secondary index production (assignment indexing);
- Production and maintenance of indexing aids.

AD-776 808/8GA PC$3.25/MF$1.45
Syracuse Univ N Y
DATA MANAGEMENT SYSTEMS FOR STRUCTURED INFORMATION RETRIEVAL.
Interim rept. Jul 71-Jul 72,
Leo H. Groner, and Amrit L. Goel. Feb 74, 48p Rept no. TR-72-3 RADC-TR-73-410
Contract F30602-72-C-0281

Descriptors: *Information retrieval, *Data management, *Cost effectiveness, Data processing, Information centers, User needs, Computer programming.

The report describes some of the advantages and problems of using generalized data base management systems in information retrieval. A particular system, Data Manager -1, was studied to derive use and cost criteria. System costs were then obtained as a function of cost components and user demands for outputs. The methodology developed has been applied to a set of design problems relevant to GDMS/IR data base design. (Author)

AD-776 960/7GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J Engineering Data Storage and Retrieval Project
BREAKING THE LANGUAGE BARRIER FOR THE R AND D ENGINEER AND SCIENTIST.
Interim rept.,
Leo G. Volkheimer. 1 Apr 74, 6p Rept no. EDS/R-79

Descriptors: *Information retrieval, *Natural language, *User needs, *Engineers, Data banks, Computers, Indexing, Data management.

The article discusses the cryptanalytic retrieval techniques that have been developed by the EDS and R project. These techniques will enable the bench level scientist or engineer, using his own language, to retrieve information from computerized data banks. The article recommends testing these techniques, using the D.S.A. cataloging file as the test vehicle. (Author)

AD-777 018/3GA PC$3.00/MF$1.45
Illinois Univ Urbana Electromagnetics Lab
MICROWAVE INTEGRATED CIRCUITS, ELECTROMAGNETIC SCATTERING, AND OPTICAL DATA PROCESSING.
Final rept. 1 Feb 71-31 Jan 74,
R. Mittra, and T. Itoh. Jan 74, 16p Rept nos. UIEL-74-2, UILU-ENG-74-2539 AROD-5405.40-E
Grant DA-ARO-D-31-124-71-G77

Descriptors: *Army research, Microwave equipment, Integrated circuits, Optical equipment, Fiberoptics, Electromagnetic scattering.
Identifiers: Optical data processing, Image processing.

Technical accomplishments in the various research projects sponsored by the Army Research Office under Grant No. DA-ARO-D-31-124-G77 are summarized. These projects include microwave integrated circuits, integrated optics, image processing, and numerical electromagnetics. A list of published articles is also included. (Author)

COM-74-50058-02/GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
DIMENSIONS/NBS. VOLUME 58, NUMBER 2, FEBRUARY 1974.
Monthly technical news bulletin.
Feb 74, 24p NBS/DIM-58/2
Library of Congress Catalog Card no. 25-26527.
Paper copy available from GPO $6.50/year as C13.13:57, $0.65/copy as C13.13:58/2.

Descriptors: *Periodicals, *Research projects, Consumers goods, Safety, Pipeline transportation, Alaska, Crude oil, Ferrites, Castings, Radiology, Measurement, Standards.
Identifiers: Announcement bulletins.

Contents:
- How safe are consumer goods;
- Industry incentives program underway;
- Scientific cross-fertilization;
- Scientists fight chilblains and the clock in Alaskan oil baseline study;
- Measuring the national measurement system;
- That equity may prevail;
- NBS contributes to ferrite measurement in stainless welds and castings;
- Reducing the health hazards of poor radioactivity measurement;
- Burglars beware.

COM-74-50177/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Reactor Radiation Div.
NBS REACTOR: SUMMARY OF ACTIVITIES JULY 1972 TO JUNE 1973.
Interim rept. 1 Jul 72-30 Jun 73,
Robert S. Carter. Feb 74, 134p NBS-TN-813
Paper copy available from GPO $1.55 as C13.46:813.

Descriptors: *Nuclear research and test reactors, *Research projects, Neutron scattering, Neutron activation analysis, Crystallography, Isotopes.

The report summarizes all those programs which depend on the NBS reactor. It covers the period from July 1972 through June 1973. The programs range from the use of neutron beams to study the structure and dynamics of materials through nuclear physics and neutron standards to sample irradiations for activation analysis, isotope production and radiation effects studies. (Author)

JPRS-61363 PC$4.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
REFERENCE AID DIRECTORY OF JPRS AD HOC PUBLICATIONS JANUARY-DECEMBER 1973.
1 Mar 74, 90P*
Trans. of Russian articles from various journals.

Descriptors: *Translations, *Bibliographies, Documentation, Books, USSR.

The directory lists the JPRS ad hoc publications issued in 1973. The Russian scientific and technical translations are arranged by subject category while the others are organized by geographic area.

N74-17670/2GA PC$9.25/MF$1.45
Mullard Research Labs., Red Hill (England).
ANNUAL REVIEW 1972: A SELECTION OF SHORT ARTICLES DESCRIBING SOME OF THE PROJECTS CARRIED OUT IN THE LABORATORIES DURING THE YEAR.
1972, 125p

Descriptors: *Epitaxy, *Integrated circuits, *Interferometers, *Ion implantation, *Magneto-optics, Computerized design, Research and development, Systems engineering.

For abstract, see STAR 1208

N74-17679/3GA PC$10.00/MF$1.45
Hungarian Academy of Sciences, Budapest.
YEARBOOK, 1972.
1972, 156p NP-19833

Descriptors: *Chemistry, *Computer techniques, *Nuclear physics, *Research and development, High energy interactions, Optical properties, Solid state physics.

For abstract, see STAR 1208

PB-229 924/6GA PC$10.25/MF$1.45
Milwaukee Urban Observatory, Wis.
INFORMATION NEEDS IN MILWAUKEE: AGENCIES AND GROUPS.
Final rept.,
Marilyn M. Levine. 1973, 142p UO-LCCM-MIL-73-008
Contract HUD-H-987

Descriptors: *Information systems, *Utilization, Evaluation, Libraries, Services, Surveys, Interviews.
Identifiers: *Information needs, *Use studies, *Housing and urban development research, User needs.

The report presents the results of a study about (1) the kinds of information urban agencies use, (2) their perceived needs, (3) how perceived needs differ from actual needs, (4) where information problems lay, (5) if a system based on computerized techniques is feasible, (6) staff perceptions and attitudes toward computerization, and (7) their willingness to participate in and pay to support an experimental system. It makes recommendations for an experimental information system that would gather, in one place, through one medium, selected data and references to the locale of other scattered information that may be needed for policy development, implementation, and evaluation in Milwaukee.

PB-230 075/4GA PC$5.00/MF$1.45
Ohio State Univ. Libraries, Columbus. Mechanized Information Center.
ANNUAL REPORT OF THE MECHANIZED INFORMATION CENTER (2ND) FEBRUARY 1, 1972 THROUGH 31 JANUARY 1973.
Gerald J. Lazorick, and Bernard Bayer. Mar 73, 155p* MIC-AN-02
Grant NSF-GN-27458

Descriptors: *Information centers, *Information systems, *Libraries, Data storage, Data retrieval, Market research, Computers, Management engineering.
Identifiers: *Library automation, Information sources.

The Merchanized Information Center (MIC) is an information services organization for faculty, staff, and students of The Ohio State University and for outside users. MIC also performs research into ways of handling information and marketing information services. During the period covered by the report, MIC provided weekly, computer-based, current awareness services to 1,785 people and individual, computer-based retrospective services to 1,271 people. The services provided customized bibliographies from large data bases. During the year, more than a million references to articles, books, conference papers, and government reports were generated. Each reference was on a separate catalog card. The report includes details on the technical aspects of the operation, as well as details on a marketing program for the services.

PB-230 411/1GA PC$3.75/MF$1.45
Naval Research Lab., Washington, D.C.
REPORT OF NRL PROGRESS.
Oct 73, 86p
Also available on subscription $22.50/year domestic, $28.25/year foreign.

Descriptors: *Naval research, *Periodicals, Oceanography, Marine engineering, Moorings, Polymers, Sonar detection, Radio communication, Physical metallurgy, Radiation shielding, Crystal oscillators, Gas lasers, Sea states, Radar detection, Water pollution, Geology, Plasmas(Physics), Solid state physics, Astrophysics.

Contents: Ocean technology at NRL-programs to solve Navy problems; Hydromechanics research at the Naval Research Laboratory; Progress notes in the following areas: Acoustics, Communications sciences, Metallurgy, Nuclear sciences, Ocean technology, Optical physics, Radar, and Solid state physics.

PB-230 543/1GA PC$6.75/MF$1.45
National Academy of Sciences, Washington, D.C.
INTERNATIONAL DEVELOPMENT PROGRAMS OF THE OFFICE OF THE FOREIGN SECRETARY,
Harrison Brown, and Theresa Tellez. Oct 73, 75p
Contract AID/csd-2584

Descriptors: *Scientific research, *Program implementation, *International relations, *Developing countries, Technology development, Technology transfer, Institutional framework, Reviews, Performance evaluation, Organizations, Project planning, Attitudes, Specialized training, Recommendations.
Identifiers: International development programs.

The report is a history of events and analysis of results of joint programs between the National Academy of Sciences and counterpart groups in developing countries during 1959-1971.

PB-230 767/6GA PC$6.75/MF$1.45
Commonwealth Scientific and Industrial Research, Organization, Melbourne (Australia).
CSIRO ABSTRACTS, VOLUME 22, NUMBER 1, 1974.
1974, 75p
Abstracts of CSIRO Published papers: Translations. See also PB-226 803.

Descriptors: *Scientific research, *Abstracts, Australia, Biology, Chemistry, Physics, Engineering, Fisheries, Oceanography, Food, Land use, Minerology, Textiles, Agriculture.

Abstracts of papers by officers of the following Divisions are included: Animal Genetics; Animal Health; Animal Physiology; Applied Chemistry; Applied Physics; Atmospheric Physics; Building Research; Chemical Engineering; Environmental Mechanics; Fisheries and Oceanography; Food Research; Irrigation Research, Land Resources Management; Mathematical Statistics; Mechanical Engineering; Mineral Chemistry; Textile Industry; Wheat Research; Wildlife Research.

5C. Economics

AD-776 581/1GA PC-GPO/MF$1.45-NTIS
American Univ Washington D C Foreign Area Studies
AREA HANDBOOK FOR THE REPUBLIC OF TURKEY,
Richard F. Nyrop, Beryl Lieff Benderly, William W. Cover, Melissa J. Cutter, and Ahmet O. Evin. May 73, 424p DA-PAM-550-80
Supersedes report dated 1970, AD-707 019. Library of Congress catalog card no. 72-600058.
Availability: Paper copy available from GPO $5.90 as DA101.22:550-80.

Descriptors: *Turkey, *Handbooks, Economics, Political science, Sociology, National defense, Agreements, Communication and radio systems.
Identifiers: *Area studies.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

AD-776 710/6GA PC$3.00/MF$1.45
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
A THEORY OF MONEY AND FINANCIAL INSTITUTIONS. PART XVIII. A NONCOOPERATIVE MODEL OF A CLOSED TRADING ECONOMY WITH MANY TRADERS AND TWO BANKERS.
Martin Shubik. 19 Mar 74, 20p Rept no. Discussion Paper-374
See also Part 17, AD-774 498.

Descriptors: *Economic models, *Banking, *Commerce, *Game theory, Equilibrium(General), Consumption.
Identifiers: *Noncooperative games, Credit, Prices.

In previous papers Shapley and Shubik have formulated a noncooperative game model of a closed trading economy where one commodity is used as a means of payment. In the present paper the existence of a noncooperative equilibrium was proved; the role of cash flow and the need for credit was examined and the relationship between the noncooperative equilibria and the competitive equilibria was illustrated.

AD-776 959/9GA PC-GPO/MF$1.45-NTIS
American Univ Washington D C Foreign Area Studies
AREA HANDBOOK FOR THE UNITED REPUBLIC OF CAMEROON,
Harold D. Nelson, Margarita Dobert, Gordon C. McDonald, James McLaughlin, and Barbara Marvin. 1974, 337p DA-PAM-550-166
Library of Congress catalog card no. 73-600274.
Availability: Paper copy available from GPO $6.35.

Descriptors: *Africa, *Handbooks, Economics, Political science, Sociology, Communication and radio systems, Military forces(Foreign).
Identifiers: *Area studies, *Cameroon.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

AD-911 615/3GA PC$7.50/MF$1.45
Army War Coll., Carlisle Barracks, Pa.
SELF-SUFFICIENCY IN ENERGY - A NATIONAL POLICY.
Research paper,
Vincent Dambrauskas. Mar 73, 88p
Distribution Limitation now Removed.

Descriptors: *Energy management, United states, *Natural resources, Preservation, Law, Standards, Coal, Hydrogen, Coal gas, Petroleum, Fuels, Oils, Nuclear power plants, Electic power production, Petroleum industry, Costs, Environment, Public health, Safety, Air pollution.
Identifiers: *Energy resources, Exports, Export quotas, Foreign trade, Government policy, Import quotas, National security, National policy, Pipelines, *Self sufficiency.

The basic question is whether the United States should follow a policy of being self-sufficient in energy resources. The supplies of domestic resources were examined along with projections for energy needs. In addition, future technology and impact of government regulation and environmental concern were assessed for their contribution to energy supply and demand. The projected energy balance sheet was reviewed in light of conditions of national security to formulate policy recommendations. The conclusion was that the United States is not now and cannot be self-sufficient in energy before 2000; however, the long

term policy must be self-sufficiency. To achieve this, the United States should take action to: establish a single policy coordinating body for energy, abolish present oil import quota system, implement selected measures to conserve energy, diversify and increase government support of energy research, and in the interim, exploit a diversity of foreign sources. (Author)

COM-73-50182/GA
PC-GPO/MF$1.45-NTIS/copy
Bureau of International Commerce, Washington, D.C.
OVERSEAS BUSINESS REPORTS.
1973-74,approx. 110 issues
Paper copy available from GPO $28.50/year as C1.50:73, $0.30/copy.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:
OBR-73-75. Market Profiles for Africa. Dec 73, 46p, supersedes OBR-72-074 COM-73-50182-75/GA

COM-73-50835-12/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME IV, NUMBER 12,
18 Mar 74, 44p
Paper copy available from GPO $29.80/year as C1.58:4, $1.15/copy as C1.58:4/12.

Descriptors: *Commerce, Crude oil, Electric power, Sunlight, Mass transportation, International trade, Research.

Contents:
Scarcity of oil creates new uncertainties in the U.S. economy but embargo does not paralyze business;
Sun could brighten long-term energy picture for U.S. economy;
Better mass transit systems seen luring U.S. commuters from cars;
U.S.-USSR trade, economic council holds first session;
Domestic business report;
Energy management digest;
International commerce report.

COM-73-50835-13/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME IV, NUMBER 13.
1 Apr 74, 42p
Paper copy available from GPO $29.80/year as C1.58:4, $1.15/copy as C1.58:4/13.

Descriptors: *Commerce, Automobiles, Energy conservation, Small businesses, Police, International trade.

Contents:
The automobile industry in transition: small car sales outrun production;
Maritime conservation effort pays energy bonus to industry;
From China with skill-MESBIC founder wants to share her talent;
Police productivity means grief for lawbreakers, relief for taxpayers;
Energy management digest;
Domestic business report;
International commerce report.

COM-74-10483/GA
see prices of individual reports
International Customs Tariffs Bureau, Brussels (Belgium).
INTERNATIONAL CUSTOMSJOURNAL. YEAR 1973-1974.
Bulletins.
1973,74approx. 50 issues annually

The reports present authoritative information for exporters, importers, investors, manufacturers, and those concerned with international trade. They contain the schedules of duties and exemptions applicable to goods imported into or exported from the country. Order by individual numbers listed below:
Bull-088. Democratic People's Republic of Algeria. 9th ed, Nov 73, 257p, PC$6.50/MF$1.45 COM-74-10483-088/GA

COM-74-10602/2GA PC$3.25/MF$1.45
Oregon State Univ. Extension Service, Corvallis. Marine Advisory Program.
THE FUTURE OF OREGON MARITIME INDUSTRIES.
24 May 73, 49p NOAA-74021101
Proceedings of Conference sponsored by Oregon State University Extension Service, Marine Advisory Program, Portland, Oregon, 23-24 May 73.

Descriptors: *Maritime industry, *Meetings, *Oregon, Economic factors, Maintenance, Maritime law, Maritime construction, Management, Marine economics, Ocean environments, Manpower.
Identifiers: Sea Grant program.

Recommendations resulting from the workshops held at the conference are summarized under the following headings: Improving the economic position of Oregon's building and repair yards; maritime regulatory agencies, industry problems, solutions; labor and management goals and responsibilities; maritime industries and the environment; intermodal transportation systems and U.S. trade policy; and government and the Jones Act.

COM-74-10606/3GA PC$3.00/MF$1.45
Oregon State Univ. Extension Service, Corvallis. Marine Advisory Program.
HOW TO CALCULATE PROFIT IN A FISHING BUSINESS,
Frederick J. Smith. Dec 73, 4p SG-29 NOAA-74021307

Descriptors: *Fishing, *Fish economics, *Profits, Cost analysis, Expenses, Management, Accounting, Return on investment.
Identifiers: Sea Grant program.

Information is given on the method to calculate profit in a fishing business. An example of a balance sheet for a typical business is used to illustrate the methods proposed.

COM-74-10610/5GA Reprint
Chicago Univ., Ill. Center for Urban Studies.
HIERARCHICAL DIFFUSION: THE BASIS OF DEVELOPMENTAL FILTERING AND SPREAD IN A SYSTEM OF GROWTH CENTERS,
Brian J. L. Berry. 1972, 18p EDA/OER-73-101
Pub. in Growth Center in Regional Economic Development, p108-138 1972.

Descriptors: *Economic models, *Market research, Blighted areas, Economic development, Regression analysis.
Identifiers: Growth centers.

The paper expands upon Perroux's original notion of poles of growth that diffuse growth through the economy indefinite channels. It builds on previous attempts to model the hierachical diffusion process by focusing on models that involve probability maximizing assumptions, and linking national spread and hierachical diffusion of growth opportunities from one urban center to another, to the spread effects within urban fields arising from the use households make of these opportunities. Diffusion of television stations and marked penetration by the television industry in the United States in the period 1940-1968 is used for empirical verification through statistical analysis. The author concludes by asking, 'Can growth centers be used to induce development in these lagging poverty regions.' If by 'development' is meant bringing population growth to approximately that of the nation with steadily rising real incomes, the models presented earlier suggest several variables to be influenced in achieving such goals: threshold limitation, diffusion times, and accessibility.

COM-74-10611/3GA PC$15.50/MF$1.45
Bureau of Economic Analysis, Washington, D.C.
IMPLEMENTATION AND EVALUATION OF MRIO MODEL,
Research rept.,
Albert J. Waldenhaug, Raymond C. Rogers, and Howard L. Schreier. Aug 72, 248p EDA/OER-73-106
Contract EDA-OER-99-7-13209.1
See also COM-73-10532.

Descriptors: *Economic models, *United States, Economic development, Consumption, Production, Employment, Salaries, Commerce, Regional planning, Computer programming, Data processing.
Identifiers: *Multiregional input output models, Gross national product.

An evaluation is presented of the multiregional input-output study conducted by the Harvard Economic Research Program as to its economic rationale, mathematical formulation, and data base particularly as these are reflected in the study's results for forty-four regions in the years 1963, 1970, and 1980.

COM-74-10641/0GA Reprint
Washington Univ., Seattle. Center for Urban and Regional Research.
AN EMPIRICAL REGIONAL INPUT-OUTPUT PROJECTION MODEL: THE STATE OF WASHINGTON 1980.
Research rept.,
Charles M. Tiebout, Philip Borque, and Karen Polenske. 1969, 10p Reprint-17 EDA/OER-73-067
Prepared in cooperation with Harvard Univ., Cambridge, Mass.
Pub. in The Review of Economics and Statistics, v51 n3 p334-340 Aug 69.

Descriptors: *Economic forecasting, *Information systems, Economic development, Input-output routines, Mathematical models, Washington(State).

The paper explains the model which was developed to relate projections of endogenous variables of a particular region--the state of Washington in the instance of this projection - to exogenously provided projections of activities elsewhere. The model is presented in a form which might be applicable to a projection for any region, but in exposition the reference to Washington state reflects the specific region whose output, employment, and income is to be projected by this empirical study.

COM-74-10673/3GA Reprint
California Univ., Berkeley. Inst. of Urban and Regional Development.
A REGRESSION ANALYSIS OF INTERREGIONAL MIGRATION IN CALIFORNIA,
Andrei Rogers. 1967, 10p Reprint-29 EDA/OER-74-110
Pub. in The Review of Economics and Statistics, v49 n2 p262-267 May 67.

Descriptors: *Population migrations, *California, *Economic opportunity, Employment opportunity, Motivation, Regions.

An attempt is made to test the hypothesis that internal migration is held to be an important way by which people respond to changing economic opportunities and thereby redirect the spatial allocation of labor toward a more optimal pattern. This is to be achieved by measuring statistically the degree of association between spatial variations in

economic opportunities and variations in interregional flows in California. Data used are the U.S. Census 1955-1960 inter-state economic area (SEA) flows. The technique of analysis if multiple regression.

COM-74-10682/4GA Reprint
North Carolina Univ., Chapel Hill. Graduate School of Business Administration.
VARIATION OF INPUT-OUTPUT COEFFICIENTS FOR DIFFERENT LEVELS OF AGGREGATION,
Gerald J. Karaska. Mar 68, 15p EDA/OER-74-194
Grant EDA-OER-040-G-66-3
Pub. in Jnl. of Regional Science, v8 n2 p215-227 1968.

Descriptors: *Input-output models, *Urban areas, Applications of mathematics.

A brief discussion of the use of coefficients in the input-output model for the Philadelphia Metropolitan area (1960) is covered in this article. The paper cites several applications of coefficients - technological, local and import - to the model. It contains a review of the Philadelphia study design, industrial classification and the procedures used in obtaining data. A brief explanation of the mathematical structure of the coefficients is presented.

COM-74-10683/2GA PC$5.50/MF$1.45
North Carolina Univ., Chapel Hill. Graduate School of Business Administration.
THE FAILURE OF MIGRATION OF LABOR TO REDUCE WAGE AND INCOME DIFFERENTIALS ACROSS REGIONS,
Lawrence Belkin. 1973, 46p EDA/OER-73-084
Grant EDA-OER-224-G-68-12

Descriptors: *Labor migration, *Economic analysis, *North Carolina, *Program review, Performance evaluation, Regional economy, Wage rates, Constraints, Economically depressed areas, Analysis of variance, Attitudes.

The paper suggests some reasons why regional income-flow differentials, through the migration of labor, have not been very effective in equalizing regional wage rates and income in depressed areas such as the Coastal Plains. Emphasis is placed on the experience of the North Carolina Mobility Project. The author holds that mobility projects have a tendency to move workers who would have moved anyway, and that projects such as the Mobility Project have not appeared to contribute to regional development. Among the reasons given for the low propensity to migrate are: a lack of knowledge of existing opportunities, a lack of skills or education, ties to the local community, and a lack of available housing.

COM-74-10686/5GA PC$5.75/MF$1.45
Kentucky Univ., Lexington. Dept. of Economics.
TAXES, SUBSIDIES AND LOCATIONAL CHOICE,
William J. Stober. Oct 70, 54p Discussion Paper-36 EDA/OER-74-202
Grant EDA-OER-227-G-68-11
Report on Program on the Role of Growth Centers in Regional Economic Development.

Descriptors: *Corporations, *Sites, *Economic models, Selection, Corporation taxes, Economic impact, Finance, Incentives, Decision making, Subsidies, Mathematical models, Federal income taxes, State taxes, Local government, Variations, Statistical analysis.

The purpose of this paper is to develop a model for evaluating the impact, or potential impact, of taxes and financial incentives on the choice of industrial location. The question of locational choice is first examined in the absence of taxes. The model is broadened to include the effects of the federal income tax, and then state and local tax differentials are introduced. Finally, several different types of financial incentives are incorporated. Difficult problems posed by uncertainity are not considered, and the location decision is examined in a largely risk free setting.

COM-74-10730/1GA PC$5.25/MF$1.45
Texas Agricultural Experiment Station, College Station.
ESTIMATED COSTS AND RETURNS FOR GULF OF MEXICO SHRIMP VESSELS: 1971.
Department technical rept.,
Ronald D. Lacewell, Wade L. Griffin, James E. Smith, and Wayne A. Hayenga. Jan 74, 45p TAES-TR-74-1 NOAA-74022628
Grant NOAA-033-042-19

Descriptors: *Shrimps, *Fish economics, *Mexico Gulf, Shrimp fisheries, Cost estimates, Profits, Investments, Commercial fishing, Merchant ships.

The study is an analysis of expected vessel costs, returns, and economic implications of alternative shrimp price situations. Costs and return estimates were based on 1971 data taken from 29 vessels separated in two classifications: (1) 53 to 65 foot and (2) 66 to 72 foot. Annual landings of shrimp were 41,551 and 56,933 heads-off pounds for small and large vessels, respectively. The investment analysis indicated that the internal rate of return for a small vessel was 24% without external financing and 50% with normal financing arrangements of an 80% loan at 8% interest for 6 years. This compares to an internal rate of return for large vessels of 7% without financing and 32% with the financing arrangement described above. (Modified author abstract)

COM-74-10738/4GA PC$20.25/MF$1.45
Topeka, Kans. Forbes Transition Steering Committee.
THE STUDY OF THE RE-UTILIZATION OF FORBES AIR FORCE BASE. PART ONE. INITIAL FEASIBILITY STUDY. PART TWO. INITIAL DEVELOPMENT PLAN.
Feasibility study.
Oct 73, 341p EDA-74-001-7310
Prepared by the Kiene and Bradley Partnership, Topeka, Kans.

Descriptors: *Military air facilities, *Kansas, *Regional economy, Deactivation, Impact, Activation, Community relations, Urban planning, Economic factors, Resources, Classifications, Utilization, Industrial relations, Housing planning.
Identifiers: *Topeka(Kansas), Forbes Air Force Base.

The report has been written in two parts consisting of the Initial Feasibility Study and the Initial Development Plan. Part one provides a general inventory and assessment of the physical resources of Forbes Air Force Base. Part two is based on the reuse potential developed in Part one.

COM-74-50061/GA PC$0.25/copy
Bureau of International Commerce, Washington, D.C.
FOREIGN ECONOMIC TRENDS AND THEIR IMPLICATIONS FOR THE UNITED STATES.
1974,147 issues
Paper copy available from GPO $37.50/year as C42.30.

The series of reports presents current business and economic developments in every country that offers a present or potential market for United States goods. The reports include a summary of the prospective impact on the United States economy, changing trade patterns prospective business trends, balance of payments, government policies, and investments. For individual country reports, order by COM-number listed below:
ET-74-016. Ecuador. Annual rept. Apr 74, 11p, supersedes ET-73-011 COM-74-50061-016/GA

COM-74-50112-03/GA PC-GPO/MF$1.45-NTIS
Bureau of Economic Analysis, Washington, D.C.
SURVEY OF CURRENT BUSINESS. VOLUME 54, NUMBER 3, MARCH 1974.
Monthly periodical rept.
Mar 74, 99p
Paper copy available from GPO $34.45/year as C56.109:54/3 including weekly statistical supplement, $2.25/copy as C56.109/54/3 microfiche also available from NTIS $9.00/year.

Descriptors: *Current business statistics, *Economic surveys, *Economic intelligence, Balance of payments, Business economics, Gross national product, United States, Financial developments, Price developments, Construction funding, Investment activity, Business capitalization, Foreign affiliates, Commodity data.
Identifiers: Survey of current business, Monthly summaries.

Contents: Recent financial developments; Price developments; Construction expenditures; Revised manufacturing and trade sales, inventories, and inventory/sales ratios; National income and product tables; Investment programs and sales expectations for 1974; New estimates of fixed nonresidential business capital in the United States, 1925-73; Property, plant, and equipment expenditures by majority-owned foreign affiliates of U.S. companies, 1973 and 1974; and U.S. balance of payments developments.

COM-74-50269/1GA PC-GPO/MF$1.45-NTIS
Foreign-Trade Zones Board, Washington, D.C.
ANNUAL REPORT (35TH) OF THE FOREIGN-TRADE ZONES BOARD TO THE CONGRESS OF THE UNITED STATES FOR THE FISCAL YEAR ENDED JUNE 30, 1973.
30 Jun 73, 72p
Paper copy available from GPO $0.75.

Descriptors: *Foreign trade zones, *Reporting, International trade.

Contents: Report of the executive secretary of the Foreign-Trade Zones Board; New foreign-trade zones; Zone expansions; Public hearings, seminars, and meetings; Applications pending; New proposals-industrial parks; Role of U.S. Foreign-Trade Zones-a perspective; Reports of the foreign-trade zone grantees (New York, New Orleans, San Francisco, San Francisco Subzone No. 3A, Seattle, Mayaguez, P.R., Toledo, Honolulu, Honolulu Subzone No. 9A, Bay County, Mich., McAllen, Tex.).

COM-74-70007/1GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. FLOUR MILLING PRODUCTS. SEASONAL ADJUSTMENT SUPPLEMENT: 1962 TO 1972.
Sep 73, 7p M20A-Supp
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25.

Descriptors: *Flour milling products, *Wheat, Production, Tables(Data).

The report presents seasonally adjusted data for a number of the most important series published monthly in Current Industrial Report Series M20A, Flour Milling Products. For each series the following are shown: Seasonally adjusted data; data without seasonal adjustment (original series); seasonal adjustment factors; and average percentage changes and related measures for each series. Data are given on wheat flour production, millfeed production, and wheat ground for flour.

COM-74-70008/9GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. SHEETS, PILLOWCASES, AND TOWELS - 1972.
May 73, 4p MA-2X(72)-1
Paper Copy available from Bureau of the Census, Washington, D.C. 20233 $0.25.

Descriptors: *Manufacturers shipments, *Towels, *Sheets, Tables(Data), Productivity statistics, Household fabrics.

The report presents statistics for the United States, 1972 and 1971, on the quantity and value of shipments of woven sheets, pillowcases, and towels, by kind. Data are also shown on the quantity and value of shipments of woven sheets, pillowcases, and towels, by distribution channels and type of finish.

COM-74-70009/7GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. CLOSURES FOR CONTAINERS. JANUARY 1973.
Mar 73, 4p M34H(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.15.

Descriptors: *Manufacturers shipments, *Containers, *Closures, Glass seals, Metallic seals, Plastic seals.

Quantity of shipments of closures for glass, metal, and plastics containers are shown by type of closure for the current and preceding month, with comparative figures for the current month a year ago. A summary is included, showing quantity of producers' shipments of principal types of closures for containers for the current month and each of 24 preceding months.

COM-74-70010/5GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. CONSTRUCTION MACHINERY. 1972.
May 73, 23p MA-35D(72)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25

Descriptors: *Manufacturers shipments, *Construction equipment, Tables(Data), Manufacturing industries, Exports.

The report provides data on manufacturers' shipments of construction machinery in the United States in 1972. Data are shown for the value of shipments of construction machinery, by class of product, for 1972, 1971 and 1967, with comparative figures from the 1971 Annual Survey of Manufactures and the 1967 Census of Manufactures. For 1972 and 1971, annual data are shown for the quantity and value of total, domestic, and export shipments of power cranes, draglines, and shovels along with annual and quarterly data on construction machinery covered in MQ-35D. Also shown for each product, are the number of companies with shipments of $100,000 or more. A separate table provides data on the quantity and value of manufacturers' shipments, exports of domestic merchandise, and percent exports to manufacturer's shipments of selected products of construction machinery.

COM-74-70012/1GA Not available NTIS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURERS - 1971. GENERAL STATISTICS FOR INDUSTRY GROUPS AND INDUSTRIES.
Final rept.
Apr 73, 25p M71(AS)-1
Paper copy available from Bureau of the Census, Washington, D.C. or Dept. of Commerce District Office, Washington, D.C. 20233, $7.75 for entire series (1971 reports), $0.25/copy.

Descriptors: *Economic surveys, *Manufacturers, Statistical data, Employment, Payrolls, Manhours, Value added, Capital expenditures, Materials costs, Shipments, Value, Industries, Salaries, Classifications.

The report presents final manufacturing establishment statistics for industry groups and industries from the 1971 Annual Survey of Manufactures, along with revised 1970 statistics. Tables in the report provide 1971 data on employment, manhours, payrolls, value added by manufacture, capital expenditures, cost of materials, and value of industry shipments for most manufacturing industries. Comparable data from the 1970 Annual Survey of Manufactures are also included. A separate table presents a regrouping of the industry statistics into aggregates which are market oriented.

COM-74-90020/9GA PC-Free
Domestic and International Business Administration, Washington, D.C.
OVERSEAS TRADE PROMOTIONS CALENDAR: JULY 1974 - JUNE 1975.
Apr 74, 49p

Descriptors: *International trade, *Trade fairs, *Trade centers, Documents, Scheduling.

This Overseas Trade Promotion Calendar is designed to assist U.S. business firms in taking advantage of extensive sales opportunities in overseas markets. It includes a 12-month schedule of U.S. Trade Center Exhibitions, International Commercial Trade Fairs in which U.S. participation is planned, and other overseas promotional activities organized or sponsored by the U.S. Department of Commerce.

COM-74-90022/6GA PC-Free/MF$1.45
Office of Minority Business Enterprise, Washington, D.C.
NATIONAL DIRECTORY OF MINORITY MANUFACTURERS-1974.
Mar 74, 123p

Descriptors: *Directories, *Manufacturers, *Minority enterprises, American Indians, Negroes, Chicanos, Commodities, Geographic area, Standard industrial classifications, Federal supply classification.
Identifiers: *Oriental Americans, *Cubans, *Puerto Ricans, *Spanish Americans, *Mexicans.

The Directory has been prepared to assist procurement personnel in both the public and private sectors to identify viable minority manufacturing firms that are available for contracting purposes. It in no way represents the totality of minority manufacuring companies. A minority manufacturing firm is defined as one that is 50% or more owned by a minority individual (American Indian, Negro, Oriental, Mexican, Cuban, Puerto Rican, Central or South American).

COM-74-90023/4GA PC-Free/MF$1.45
Bureau of East-West Trade, Washington, D.C.
FOREIGN TRADE ORGANIZATIONS IN THE USSR. PRODUCT INDEX AND DIRECTORY.
1973, 17p

Descriptors: *Foreign trade, *Commodity categories, *Information systems, *Business organizations, USSR, Indexes(Documentation).
Identifiers: *Foreign trade organizations.

There are some 60 All-Union Foreign Trade Organizations (FTOs) in the Soviet Union which operate under the supervision and control of the Ministry of Foreign Trade. The FTOs carry out the purchase of foreign goods and the sale of Soviet products abroad on behalf of their domestic customers, and usually have the exclusive trading rights for particular product categories.

COM-74-90026/7GA PC-Free/MF$1.45
Domestic and International Business Administration, Washington, D.C.
EXPORT INFORMATION SERVICES FOR U.S. BUSINESS FIRMS.
Feb 74, 12p

Descriptors: *Information systems, *Exporting, Services, United States, Commercial development, Foreign trade.
Identifiers: *Announcement bulletins.

The U.S. Department of Commerce can assist U.S. firms in many ways with a wide range of export information services. Updated, modernized handling techniques now make these services available in a fraction of the time that previously was necessary.

PB-229 813/1GA PC$5.00/MF$1.45
Agency for International Development, Washington, D.C. Office of Science and Technology.
TECHNOLOGICAL OPPORTUNITIES FOR TROPICAL FORESTRY DEVELOPMENT,
Gordon D. Fox. Nov 73, 37p TA/OST-73-21 AID-ARC-634.0-F791

Descriptors: *Tropical woods, *Technology transfer, *Forest industry, *Developing countries, Economic development, Forestry management, United States, Project planning, Utilization characteristics, Socioeconomic conditions, Political objectives, Institutional implications, Improvement, Criteria.

The paper is intended to identify the highest payoff opportunities for the application of U.S. technology to the needs of developing countries for sound management and utilization of forest resources. Specifically the paper includes: (1) development of criteria for determining whether the political-socio-economic and institutional framework in an LDC is sufficiently favorable so that technological inputs will meaningfully improve forest utilization and management; (2) identification of appropriate countries; and (3) examination of a limited number of countries to illustrate how specific technological inputs can be matched with priority needs, and assessment of likely pay-offs.

PB-229 988/8GA PC$3.75/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
CREDIT FOR FINANCING HOUSING INVESTMENT: RISK FACTORS AND CAPITAL MARKETS,
Dwight M. Jaffee. 15 Jun 73, 74p* HUD-PDR-113
Prepared by Princeton Univ., N.J. Revision of draft dated 1 Jun 73. Paper on National Housing Policy Study. Background Studies. Volume 3.

Descriptors: *Housing studies, *Investment outlook, *Financing, *Market analyses, *Federal programs, Mortgage finance, Risk analysis, Capital flow matrix, Economic theory, Reviews, Government policies.
Identifiers: *Housing and urban development research, Government intervention.

The major objective is to consider the way in which financial markets influence housing investment, and the roles for government intervention in mortgage markets and housing. The study is developed on two levels: How do risk factors relating to specific mortgage borrowers and mortgage locations affect the functioning of mortgage markets; and, on a macroeconomic level, will the free capital markets provide an adequate flow of mortgage finance. The study provides a theoretical basis, reviews the relevant literature, and draws conclusions for government policy. (Modified author abstract)

PB-230 033/3GA PC$10.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Economics.
CONCENTRATION LEVELS AND TRENDS IN THE ENERGY SECTOR OF THE U.S. ECONOMY. ECONOMIC REPORT. A STAFF REPORT TO THE FEDERAL TRADE COMMISSION.
Staff rept.,
Joseph P. Mulholland, and Douglas W. Webbink.
Mar 74, 510p* FTC-R-6-15-20

Descriptors: *Energy, *Industries, *Economic surveys, Marketing, Competition, Fuels, Coal, Petroleum industry, Gas industry, Uranium,

Economics, Prices, Statistical data, Crude oil, Natural gas, Trends, Concentrating, Mergers.

The report is a sequel to Interfuel Substitutability and addresses itself to the interrelationship between interfuel merger activity and seller concentration within the primary fuel production sector. The present study investigates ownership structure from the point of view of an aggregate fuel supply sector. All fuel production is combined in order to obtain a meaningful measure of seller concentration which can in turn be used as one indicator of the competitive condition of the energy market and the extent to which it has been affected by the movement toward energy companies. It contains a survey of the interrelationships between the four primary fuels as well as a discussion of the potential effects of rising energy diversification on performance within the energy sector. The report surveys the ownership structure as well as pertinent institutional details of the crude oil, natural gas, coal and uranium sectors, respectively, and analyzes ownership patterns within the combined fuel production market and the extent to which they have been altered by recent interfuel diversification activity.

PB-230 300/6GA PC$4.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
ANALYSIS OF SECONDARY DATA DESCRIBING FINANCIAL INSTITUTION IN SEVEN STATES OF THE RURAL SOUTH.
Discussion draft rept.,
Thomas H. Naylor. 29 Jun 73, 18p HUD-PDR-124-a
Prepared by Low Income Housing Development Corp., Durham, N.C.

Descriptors: *Banking business, *Assets, Financial management, Fixed investment, Credit, Rural areas, Alabama, Arkansas, Kentucky, Mississippi, Tennessee, Virginia, West Virginia.
Identifiers: Financial services, Federal aid, Loans, *Housing and urban development research.

The description of sample financial institutions in the seven state region (Alabama, Arkansas, Kentucky, Mississippi, Tennessee, Virginia and West Virginia) attempts to compare the banking activities of the sample with those of the financial institutions as a whole. This is a summary of the findings of the preliminary analysis examining two types of financial institutions-commercial banks and savings and loans associations, taken from samples in the seven states.

PB-230 343/6GA
Mag Tape $97.50;Foreign $122.50
Bureau of Labor Statistics, Washington, D.C.
INDUSTRY-SECTOR PRICE INDEX (ISPI), JANUARY 1965 TO PRESENT.
Data file,
Richard C. Ziemer. Jan 65, 1 reel mag tape
BLS/DF-73-008
Specify tape recording mode desired: 7 track, 556 or 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Price indexes, *Industries, *Standard industrial classifications, Magnetic tapes, United States.

The composite price index is derived from several series of prices that closely match the economic activity of a specific industry or industry sector. The file contains four digit indexes categorized according to the 1963 Standard Industrial Classification scheme.

PB-230 350/1GA PC$17.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
ECONOMIC ANALYSIS OF TWELVE SELECTED PLANNING AND DEVELOPMENT DISTRICTS IN THE RURAL SOUTH,
William P. Linderman, and Thomas H. Naylor. 8 Jun 73, 287p HUD-PDR-124-b
Prepared by Low Income Housing Development Corp., Durham, N.C.

Descriptors: *Econometrics, *Rural areas, Economic surveys, Population(Statistics), Statistical analysis.
Identifiers: Planning and development districts, *Housing and urban development research.

The analysis is based on data primarily from U.S. Bureau of the Census sources and covers a twenty year period from 1950 to 1970. What emerges from this analysis is generally consistent in all the twelve states in that while the data reveal growth in these districts, the growth has been generally slow and sporadic. However, this analysis can only be regarded as preliminary as additional information is required to fully understand the dynamics of the economic systems under study and to properly assess the trends as served in the secondary data.

PB-230 562/1GA
Mag Tape $97.50;Foreign $122.50
Bureau of Labor Statistics, Washington, D.C.
INDUSTRY-OCCUPATIONAL MATRIX-NATIONAL, 1960-FUTURE PROJECTION (1970-80).
Data file,
Alan A. Anderson, Jr. 1974, 1 reel mag tape
BLS/DF-73-001
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Economic surveys, *Industry surveys, *Employment surveys, *Demographic surveys, United States, Magnetic tapes.

The industry-occupational matrix is the result of coordinated research in areas such as the growth and changing composition of the population and the labor force, the relative growth of industries; the effect of automation, other technological changes, and other economic factors on industry employment; and the occupational structure of industries. The end-product of this program is a consistent and reasonably detailed national manpower framework of employment levels and ratios that may be used as a guide in developing state and area manpower requirements estimates. There are approximately 90,000 variable length records.

PB-230 966/4GA PC$3.25/MF$1.45
Texas Univ., Austin. Natural Fibers Economic Research.
THE TEXAS WOOL AND MOHAIR WAREHOUSES, 1971-72.
Final rept. 1971-72,
May H. Harris. Sep 73, 38p NFFPC-NFER-UT-103-73

Descriptors: *Wool, *Industry surveys, *Texas, Industry productivity, Warehouses, Operating costs, Marketing.

The report enumerates the various services offered by the Texas warehouses, costs involved, facilities and equipment used, methods of operation, and problems incurred in the profitable marketing of wool and mohair.

5D. History, Law, and Political Science

AD-776 362/6GA PC$3.00/MF$1.45
Hawaii Univ Honolulu Dept of Political Science
QUARTERLY TECHNICAL REPORT NO. 2, OCTOBER 1, 1973-DECEMBER 31, 1973,
R. J. Rummel. Feb 74, 7p
Contract N00014-67-A-0387-0018, ARPA Order-2519
Report on The Dimensionality of Nations Project. See also report dated Oct 73, AD-771 291.

Descriptors: *International relations, *Behavior, *Asia, Mathematical analysis, Equations, Political science, Group dynamics.
Identifiers: *Dimensionality of nations project, *Dyadic relations.

The second quarterly 1973 technical report for DON covers four kinds of analyses completed during the quarter. One was an image super-P analysis of behavior and attributes and the linkage of the behavior dimensions delineated to attribute distances. Another was an analysis determining four basic behavior-attributes linkages general to such actors as China, U.S.S.R., and the U.S. A determination was also made of how actors group in the similarity of their linkages. (Modified author abstract)

AD-776 548/0GA PC$9.00/MF$1.45
Army War Coll Carlisle Barracks Pa
ABSTRACTS OF STUDENT RESEARCH PAPERS, ACADEMIC YEAR 1973.
Student research program.
30 Jan 74, 120p

Descriptors: *Political science, *Theses, *Abstracts, International relations, Foreign policy, Mass media, Army personnel, Leadership, Military reserves.

The document contains abstracts of selected student research papers prepared at the US Army War College by students of the 1973 Class. The document consists of an index by author, abstracts of papers, and an index by subject.

AD-776 698/3GA Not available NTIS
Rand Corp Santa Monica Calif
THE PATHET LAO: LEADERSHIP AND ORGANIZATION,
Joseph J. Zasloff. Jul 73, 179p Rept nos. R-949-ARPA, ISBN-0-669-86744-6
Contract DAHC15-73-C-0181, ARPA Order-189-1
Library of Congress Catalog Card No. 73-1068.
Availability: Paper copy available from Publication Dept., RAND Corp., 1700 Main Street, Santa Monica, California, $3.00.

Descriptors: *Laos, *Communism, Leadership, Organizations, Military forces(Foreign).

The report analyzes the Laotian revolutionary movement commonly known as the Pathet Lao—its leaders, commanding party (People's Party of Laos), the Lao Patriotic Front, its political and administrative organization, and its military forces. The document also presents biographical information on 12 'founding fathers' who are probably among the leading policymakers, and discusses their characteristics. Leadership continuity is remarkable, having lasted through 20 years of intermittent war and coalition with no evidence of major purges or defections. Eight appendixes include biographies, policy statements, a list of fronts, and brief profiles of 53 informants.

COM-74-10584-01/GA
(Order as COM-74-10584)
Naval War Coll., Newport, R. I.
SOVEREIGNTY OF THE SEAS AND THE EFFECT UPON NAVAL STRATEGY,
E. L. Gallup. 1973, 107p NOAA-74020701-1
Included in Marine Affairs Jnl., n1 p1-8, Dec 73.

Descriptors: *Military strategy, *Oceans, Territorial seas, International relations, Warfare.
Identifiers: Sea Grant program.

The effects of alterations in the freedom of the seas concept upon the naval strategies of major powers under varying conditions and levels of international conflict are examined. The current trend to extend seaward the limits of national sovereignty will undoubtedly continue. Naval

strategy will be affected by the increasing restriction on the use of the oceans in inverse proportion to the level of the intensity of the conflict.

COM-74-10584/2GA PC$4.50/MF$1.45
Rhode Island Univ., Kingston. Master of Marine Affairs Program.
MARINE AFFAIRS JOURNAL. NUMBER 1, DECEMBER 1973,
William H. MacKenzie. Dec 73, 107p NOAA-74020701

Descriptors: *Oceans, *Coasts, *Periodicals, Land use, Regional planning, Military strategy, Fisheries, Solid waste disposal, Offshore drilling.
Identifiers: Sea Grant program.

The articles in this first edition of Marine Affairs Journal cover the following variety of subjects: land use, social organization and political power, military interest, economic interrelationships, and the exploitation of valuable natural resources. The six articles in this issue are abstracted separately.

JPRS-61269-1 PC$6.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
MISCELLANY OF MAO TSE-TUNG THOUGHT (1949-1968). PART I.
20 Feb 74, 242p
Trans. of mono. Mao Tse-Tung SSU-Hsiang Wan-Sui, n.p., 1969 996p.

Descriptors: *Political science, China, Translations.
Identifiers: Mao Tse-Tung.

The report contains selected speeches and writings of Mao Tse-tung covering a multitude of subjects.

5E. Human Factors Engineering

PB-230 216/4GA PC$4.25/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
INDUSTRIAL ERGONOMIC ABSTRACTS. VOLUME 5, NUMBER 3.
Open rept.,
Feb 74, 21p CEL/HF/51/73
See also Volume 5, Number 2, PB-227 461.

Descriptors: *Human factors engineering, *Man machine systems, Psychology, Physiology, Great Britain, Abstracts, Environmental engineering.
Identifiers: *Ergonomics.

Abstracts are given of reports on human engineering in industry, including the environmental design of the man-machine interface, systems design and organization, and methods, techniques and equipment.

5F. Humanities

JPRS-61437 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
THE PURPOSE OF SCIENTIFIC COLLECTIONS AND MUSEUMS,
Ivan Grigorevich Pidoplichko. 11 Mar 74, 12p
Trans. of Priroda (USSR) n9 p10-17 1973.

Descriptors: *USSR, *Museums, Translations, Paleontology, Geology, Zoology, Botany, Archeology, History.

The report comments on the resources available in certain USSR museums and on the value of museum collections for scientific research.

PATENT-3 010 208 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR DETERMINING THE AUTHENTICITY OF ANCIENT ARTIFACTS MADE OF OBSIDIAN.
Patent,
Irving Friedman, and Robert L. Smith. Filed 6 May 60, patented 28 Nov 61, 4p PAT-APPL-27 458, DOCKET/SUR-481
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Geochronology, *Obsidian, Archaeology.
Identifiers: PAT-CL-33-1.

The patent relates to a method for determining the authenticity of obsidian artifacts, or those made from volcanic glass having in general the same composition as rhyolite. By means of the method of this invention archaeological finds of artifacts ranging in age from approximately 100 to over 30,000 years, may be authenticated. This method for dating archaeological remains is founded upon the discovery that during long periods of time obsidian absorbs water from the atmosphere and forms an ever increasing but extremely thin outer hydrated layer. The depth or thickness of this layer is measurable under a microscope.

5G. Linguistics

AD-776 647/0GA PC$3.25/MF$1.45
Ohio State Univ Columbus Dept of Speech Communication
ANALYSIS OF INTONATIONAL SIGNALS BY COMPUTER SIMULATION OF PITCH-PERCEPTION BEHAVIOR IN HUMAN LISTENERS.
Technical rept.,
Yukio Takefuta. Feb 74, 27p Rept no. TR-15
Contract N00014-67-A-0232-0003

Descriptors: *Speech recognition, *Sound pitch, *Auditory perception, Voice communications, Computerized simulation, Phonology.
Identifiers: *Intonation, Speech analysis.

Computer methods for extracting physical parameters, comparing the relative efficiency of the parameters as an intonational signal, processing the extracted data, and extracting and identifying pitch patterns, are described. Fundamental pattern features and cardinal pitch patterns are defined and proposed as constituents of intonation patterns. (Modified author abstract)

AD-776 649/6GA PC$3.00/MF$1.45
Ohio State Univ Columbus Dept of Speech Communication
MULTIDIMENSIONAL ANALYSIS OF THE PERCEPTUAL UNIQUENESS OF 31 ENGLISH CONSONANTAL CLUSTERS.
Technical rept.,
John W. Black, Sadanand Singh, and Elizabeth Janocosek. Mar 74, 17p Rept no. TR-16
Contract N00014-67-A-0232-0003

Descriptors: *Speech recognition, *Phonology, Speech articulation, Phonemes, Intelligibility.
Identifiers: Consonants, Syllables.

Acoustic recordings were made of 31 'doublet' consonant-clusters with five vowels by 12 speakers. The pairs of syllables were heard by twelve listeners who assigned values to the aural differences between each pair 'in the manner of magnitude estimation'. The clusters were treated as two groups, 18 non-sibilant clusters and 13 sibilant clusters. The responses of each listener became the data for multidimensional analysis. Four-dimensional space provided the most efficient analysis for both sets of data. The interpretations of these dimensions were in terms of the features either of the first or of the second member of the consonant clusters. In the instance of the non-sibilant clusters on dimension one the perceptual feature was determined by the groupings of the second members, on dimensions two and three by the first members. (Modified author abstract)

AD-776 813/0GA PC$4.75/MF$1.45
California Univ Berkeley
DEVELOPMENT OF CHINESE-ENGLISH MACHINE TRANSLATION SYSTEM.
Final technical rept. 1 Sep 70-30 Dec 72,
William S-Y Wang, and Stephen W. Chan. Feb 74, 150p RADC-TR-74-22
Contract F30602-71-C-0116

Descriptors: *Machine translation, *Chinese language, *Computational linguistics, *English language, Syntax, Grammars, Computer programming, Dictionaries.
Identifiers: SAS(Syntactic Analysis System), Syntactic analysis system.

The report documents progress and results of a 2-1/3 year effort to further develop the prototype Chinese-English Machine Translation System. Additional rules were incorporated into the existing grammer for Chinese analysis and interlingual transfer, with emphasis on the latter. CHDIC was updated and revised. Approximately 1(,000 new entries were added to CHIDIC, bringing the total available entries to over 73,000. Linguistic work on a random access dictionary incorporating feature notation was carried out. A new design for the translation system was initiated and partially programmed for conversion of the current system from a CDC 6400 version into an IBM version. Better control of the parsing process was achieved by improving the segmentation procedures during input, and by addition of more revealing diagnostic printouts as steps toward reduction of spurious ambiguities. The Model 600D Chinese Teleprinter System was used for the first time to prepare large batches of texts for input. A total of 307 pages of machine readable texts, comprising 300,000 characters were prepared during this report. (Author)

5H. Man-Machine Relations

AD-777 020/9GA PC$3.25/MF$1.45
AAI Corp Baltimore Md
DEVELOPMENT OF A METHODOLOGY FOR OBTAINING HUMAN PERFORMANCE RELIABILITY DATA FOR A MACHINEGUN SYSTEM.
Final technical memo.,
Joseph P. McCalpin. Feb 74, 35p HEL-TM-6-74
Contract DAAD05-72-C-0003

Descriptors: *Performance(Human), *Small arms, *Human factors engineering, Reliability, Machine guns, Methodology, Failure, Taxonomy, Weapon systems.

The report describes the second in a series of efforts to establish a methodology for including human performance data in models of infantry weapon system reliability. The objectives of this study were to develop a task taxonomy to describe human performance errors to failures of weapon components. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-776 365/9GA PC$4.00/MF$1.45
Army War Coll Strategic Studies Inst Carlisle Barracks Pa
EVALUATION, INFLATION, AND ORDER OF MERIT.
Military issues research memo.,
John G. Pappageorge. Mar 74, 20p Rept no. MIRM-74-2

Descriptors: *Officer personnel, Selection, Army, Leadership, Performance(Human), Ratings.

The Army has increasingly turned to the use of various types of 'order of merit lists' as an aid to making decisions with respect to selection for schooling, promotion, and the filling of key assignments. The paper examines this scoring system, in particular the phenomenon of 'meaningful versus apparent variation'.

AD-776 376/6GA PC$3.25/MF$1.45
Human Resources Research Organization Alexandria Va
HUMRRO'S LITERACY RESEARCH FOR THE U.S. ARMY: DEVELOPING FUNCTIONAL LITERACY TRAINING.
Professional paper,
Thomas G. Sticht, John S. Caylor, Lynn C. Fox, Robert N. Hauke, and James H. James. Dec 73, 35p Rept no. HumRRO-PP-13-73
Contract DAHC19-73-C-0004
Update of Rept. no. HumRRO-PP-2-73.

Descriptors: *Job analysis, *Reading, Teaching methods, Army personnel, Methodology, Requirements, Army training, Personnel management, Human factors engineering.
Identifiers: *Literacy requirements.

The paper summarizes literacy research and development performed by HumRRO for the Army since 1968. Literacy needs for several basic Army Military Occupational Specialties (MOSs) were identified and methodology was developed to evaluate reading requirements for Army jobs. Under the current effort, an experimental training program is being designed to produce a level of functional literacy appropriate to minimal MOS requirements. (Author)

AD-776 380/8GA PC$4.75/MF$1.45
Human Resources Research Organization Alexandria Va
PROJECT IMPACT COURSEWARE SUBSYSTEM: VOLUME I. INNOVATIVE PROCEDURES FOR DEVELOPMENT AND ADMINISTRATION.
Technical rept.,
Michael J. Hillelsohn. Feb 74, 149p Rept no. HumRRO-TR-74-1
Contract DAHC19-73-C-0004, Grant NSF-GJ-774

Descriptors: *Computer aided instruction, Computer programs, Instruction manuals, Programming languages, Problem solving, Individualized training.
Identifiers: IMPACT project, Diagnostic routines, Editing routines, COBOL.

The report describes the practical, problem-solving techniques used in the design, documentation, and course materials of computerized training courses which comprised the courseware subsystem of Project IMPACT. The unique separation of course content and logic in the IMPACT system permitted these innovations. Course structure and format were standardized to meet the requirements of individualized training, controlled in part by each student and in part by a formal Instructional Decision Model (IDM). A wide variety of samples and other detailed appendices are presented for the in-depth reader who wishes to pursue particular aspects of the total courseware package. (Modified author abstract)

AD-776 538/1GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
STATISTICAL APPROACHES TO MANAGING MANPOWER DATA BASES,
D. P. Gaver, and P. A. W. Lewis. Feb 74, 28p Rept no. NPS-55Gv55Lw74021

Descriptors: *Manpower, *Data bases, *Data management, Statistics, Errors, Sampling, Inventory.

The report discusses various data bases types, with particular emphasis on controlling and understanding the error content by statistical means. A model is also made to describe a data base as an inventory; costs of modifying and maintaining the base are included. (Author)

AD-776 546/4GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
A MANPOWER AND PERSONNEL RESEARCH DATA BASE FEASIBILITY STUDY.
Final rept. Jan-Dec 73,
Kneale T. Marshall. Dec 73, 37p* Rept no. NPS-55MT73121

Descriptors: *Data bases, *Manpower, *Personnel management, Research management, Operations research, Feasibility studies, Costs.

Manpower and personnel data bases are classified into operating, staff and research types. Characteristics of each type are discussed. The demand for a research data base is discussed and approximate costs of alternatives are given. Data base structure, implementation and development are each considered together with the location of a proposed research data base. (Author)

AD-776 582/9GA PC$9.00/MF$1.45
Bureau of Social Science Research Inc Washington D C
PRETESTING NAVY CAREER INFORMATION THEMES FOR AUDIENCE INTEREST.
Final rept.,
Barry M. Feinberg, and Bruce B. Dunning. Mar 74, 120p Rept no. BSSR-450-2
Contract N00014-72-C-0546
See also report dated Mar 73, AD-758 732.

Descriptors: *Personnel development, *Verbal behavior, *Message processing, Information processing, Personnel, Retention(General), Reenlistment, Methodology, Questionnaires, Naval personnel.
Identifiers: *Communicating.

A mail survey of a Navywide sample of officers and enlisted men was conducted to pretest Navy information themes and messages for interest and predicted exposure. Respondents were asked to rate each message for interest using a Haskins-type 0-100 rating scale. The principal measures used in analysis were mean scores for individual items and proportion of respondents rating items equal to or greater than 90. Main independent variables used in analysis were a constructed content scale, a typology of topics, the officer-enlisted dichotomy, and a number of demographic variables. The data suggested strongly that content, particularly usefulness of information contained in a message, is the most important determinant of interest. (Modified author abstract)

AD-776 596/9GA PC$4.00/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
ANALYSIS AND SYNTHESIS OF TUTORIAL DIALOGUES.
Semi-annual technical rept. no. 2,
Allan Collins, Eleanor H. Warnock, and Joseph J. Passafiume. Mar 74, 84p Rept no. BBN-2789
Contract N00014-71-C-0228, ARPA Order-2284

Descriptors: *Education, *Computer aided instruction, Semantics, Artificial intelligence.
Identifiers: SCHOLAR system, Tutoring.

In this paper the authors attempt to analyze the strategies by which tutors adapt their teaching to individual students, so that they can synthesize these strategies in a computer system called SCHOLAR. To find out what strageties tutors use, the authors tape-recorded dialogues between various tutors and students on the topic of South American geography. Because SCHOLAR is a well-defined program, it is possible to analyze such ill-defined naturalistic data in precise terms, with respect to the structure and processing of information in SCHOLAR. The authors analyzed the dialogues concentrating on one aspect at a time. Based on analyses, the authors propose in this paper several hypotheses about how the tutor relates his teaching to the individual student. The author show how in modified form they have implemented some of these strategies in SCHOLAR. The authors further argue that the analytical method employed could be extended to a wide range of conversational situations. (Modified author abstract)

AD-776 619/9GA PC$4.50/MF$1.45
Manned Systems Sciences Inc Northridge Calif
TRAINING EFFECTIVENESS EVALUATION: DEVICE 1D23, COMMUNICATION AND NAVIGATION TRAINER.
Final rept.,
Clarence A. Semple, Jr. Mar 74, 102p
NAVTRAEQUIPC-72-C-0209-2
Contract N61339-72-C-0209

Descriptors: *Training devices, *Navigation, *Communication equipment, Dead reckoning, Acceptability, Requirements, Efficiency, Aircraft.

A study was performed to evaluate the training effectiveness of Communication and Navigation Training Device 1D23. Four objectives were addressed: Assess impacts of training in the device upon student dead reckoning navigation performance; determine impacts of training in the device upon communication and navigation performance in point-to-point and airways navigation; determine impacts of increased amounts of training in the device upon communication and navigation performance in dead reckoning point-to-point, and airways navigation; and develop design oriented information for application to further training device designs. Flight grades and supplemental measures of student performance were analyzed. No performance improvements were found as a result of the additional training which was examined. (Modified author abstract)

AD-776 631/4GA PC$4.25/MF$1.45
National Academy of Sciences-National Research Council Washington D C Comm on Hearing Bioacoustics Biomechanics
GUIDELINES FOR A TRAINING COURSE IN NOISE SURVEY TECHNIQUES,
John Shadley, William Gately, George W. Kamperman, and Paul L. Michael. Jan 74, 22p
Contract N00014-67-A-0244-0021
Report of Working Group 70.

Descriptors: *Courses(Education), *Training, *Technicians, *Noise, Communities, Surveys.

The course is designed to train noise survey technicians during a 3-5 day period to make reliable measurements of 75% of the noise problems encountered in the community. The more complex noise problems remaining will continue to be handled by experienced specialists. These technicians will be trained to assist state and local governments in enforcement of their noise ordinances and in investigations of noise complaints. (Author)

AD-776 658/7GA PC$3.00/MF$1.45
George Washington Univ Washington D C Graduate School of Arts and Sciences
SOCIOLOGICAL RESEARCH ON EMPLOYMENT PATTERNS OF YOUTH.
Technical rept.,
Katherine Marconi. 28 Jan 74, 24p Rept no. TR-1178
Contract N00014-67-A-0214-0016
Report on Econometric Research on Navy Manpower Problems.

Descriptors: *Employment, *Sociology, Jobs, Information, Education, Race relations, Demography, Surveys, Naval personnel, Recruiting.
Identifiers: Marriage, Age, Socioeconomic status.

Sociological research on the employment patterns of youth after entry into the labor force is reviewed for possible Naval manpower policy. Current trends regarding job duration and the occupational aspirations of youth may have possible implications for Naval enlistment policies. (Author)

AD-776 776/7GA PC$4.50/MF$1.45
Hughes Aircraft Co Culver City Calif
A SURVEY OF THE PRESENT STATE-OF-THE-ART IN LEARNING CENTER OPERATIONS.
Final rept.,

Dennis J. Sullivan, Edgar A. Smith, and Ronald H. Filinger. Feb 74, 116p AFHRL-TR-74-11
Contract F41609-72-C-0033

Descriptors: *Learning, *Facilities, Training, Education, Individualized training, Automation, Assessment, State of the art, Surveys.

The report summarizes a survey of selected military, industrial, government, and academic learning centers. Documentation of 28 learning center programs is recorded and illustrated. This documentation includes primary characteristics and a description of operational procedures and experience at the learning centers. Learning centers deemed effective were (1) designed to meet a clearly defined and existing instructional need (and typically included student performance requirements), (2) administered under a unified control of courseware content and production quality, and (3) largely developed and produced their own courseware to meet their specific needs. In general, student time savings and increased training effectiveness were reported. Learning centers can provide cost-effective instruction. (Author)

AD-776 777/5GA PC$6.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
THE SIMILARITY OF JOB TYPES REPORTED FROM TWO INDEPENDENT ANALYSES OF OCCUPATIONAL DATA.
Interim rept. 2 Apr-12 Oct 73,
William J. Watson. Feb 74, 60p Rept no. AFHRL-TR-73-58

Descriptors: *Job analysis, *Jobs, Standards, Consistency.
Identifiers: CODAP(Comprehensive Occupational Data Analysis Program), Comprehensive occupational data analysis program.

Occupational analysts using Comprehensive Occupational Data Analysis Programs (CODAP) make subjective decisions at various stages in their analysis of an occupation. The possibility exists that two different analysts could reach different conclusions in analyzing an occupation, and thereby provide divergent guidance to management. Two analysts, working independently, performed job typing using CODAP on occupational data collected by a single administration of a job inventory. Each analyst selected the same size sample at random but without any cases common, from the total survey. The job types identified by each analyst were compared to determine whether they were significantly different in any respect. Superficial differences appeared between the results of the two analyses, but were largely resolved when job types reported by the first analyst were compared not only on a one-to-one basis with job types reported by the second analyst, but also with combinations of job types reported on the second occasion. (Modified author abstract)

AD-776 780/9GA PC$8.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MOTIVATION OF MAINTENANCE PERSONNEL TO WORK PARTICULAR SHIFTS.
Master thesis,
Robert D. LaRue, and Gary D. Metzinger. Jan 74, 97p Rept no. SLSR-15-74A

Descriptors: *Maintenance personnel, *Motivation, *Job analysis, Scheduling, Work, Assessment, Questionnaires, Air Force personnel, Theses, Job satisfaction, Hygiene, Salaries.
Identifiers: *Work shifts.

The research was to identifiy and evaluate the importance of selected factors of the employees and their environment which might motivate them to work nonday shift schedules in Air Material Area (AMA) Aircraft Maintenance functions of the Air Force Logistics Command. Four general factor areas were considered: selected individual characteristics, hygiene, motivational and off-the-job aspects. A mailed questionnaire was developed to measure the perceived importance of selected factors with respect to shift preference. Data was gathered from a sample of 204 employees randomly selected from the Aircraft Divisions of the five AMA's. The results of the research indicated three sub-factors that were significantly different across shift preference groups. These subfactors were age, grade classification and salary. The other 13 subfactors were not supported as being different across shift preference groups. The implications of these results reinforce the intuitive conclusion that shift preference is largely tempered by differential pay considerations. (Author)

AD-776 782/5GA PC$12.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
EFFECT OF INSTRUCTOR UNIFORM (ARMY, NAVY, AIR FORCE, CIVILIAN) ON LEARNING AND PERCEPTION OF BASIC AIRMEN TAUGHT THROUGH THE MEDIUM OF TELEVISION.
Technical rept.,
Ronald R. Calkins. Mar 74, 177p Rept no. AU-AFIT-SL-1-74

Descriptors: *Learning, *Instructors, Attitudes(Psychology), Television systems, Surveys, Assessment, Statistical analysis.
Identifiers: *Uniforms, Experimental psychology.

The objective was to determine (for neutral topic material) whether learning and attitude of basic airmen would be effected by using instructors from different branches of Department of Defense Services teaching through the medium of television. Instructor uniform created no differences in learning or attitude when students were taught a neutral subject through the medium of television. The model may be useful for attempting to discover dissonant producing situations that effect attitude and cognitive learning. (Modified author abstract)

AD-776 784/1GA PC$13.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A STUDY OF THE METHODS BY WHICH THE UNITED STATES AIR FORCE CAN PROVIDE PROFESSIONAL MILITARY EDUCATION FOR SENIOR FOREIGN OFFICERS.
Master's thesis,
Leslie Bunn, and Richard J. Steppic. Jan 74, 207p Rept no. SLSR-3-74A

Descriptors: *Education, *Government(Foreign), Air Force, Universities, Defense systems, Military forces(Foreign), Foreign aid, Theses.

The study identifies methods that can be used by the United States Air Force to provide professional military education for senior officers from allied, friendly and nonaligned nations. Extensive interviews conducted with senior officials currently involved in professional military education provide the primary source of data. The study concludes that five methods are available to provide an increased program, and that the most feasible method is to establish a separate college for senior foreign officers co-located with other USAF professional colleges and schools at Maxwell AFB, Alabama. (Modified author abstract)

AD-776 785/8GA PC$7.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE EFFECT OF INTERRUPTIONS ON THE PRODUCTIVITY OF CIVIL ENGINEERING PLANNING TECHNICIANS.
Master's thesis,
Dennis F. Hlad, and Paul D. Vetter. Jan 74, 77p Rept no. SLSR-20-74A

Descriptors: *Civil engineering, *Engineers, *Production, *Job analysis, Performance(Human), Quiet, Interruption, Air force personnel, Theses.

In Civil Engineering Planning Shops there is presently a significant discrepancy between the amount of time originally programmed for planned work orders and the time that is actually spent in the performance of planned work. This discrepancy has been attributed to the low productivity ratio of the planning technicians (P-Ts). Several factors can adversely affect the performance of P-Ts. The most significant factor, however, appears to be outside interruptions (personal and telephone interruptions). The problem with interruptions is that each time a person stops or lets his attention turn to something else, time is wasted getting started again. The purpose of this thesis was to evaluate the effects of interruptions on P-T productivity and quality. (Modified author abstract)

AD-776 973/0GA PC$4.00/MF$1.45
Human Resources Research Organization Alexandria Va
ENLISTMENT MOTIVATION AND THE DISPOSITION OF ARMY APPLICANTS.
Technical rept.,
Allan H. Fisher, Jr., and Margi R. Harford. Mar 74, 82p Rept no. HumRRO-TR-74-5
Contract DAHC19-73-C-0004

Descriptors: *Military personnel, *Motivation, *Recruiting, Army, Statistical analysis, Factor analysis, Job training, Benefits, Education, Race relations, Personnel development.

Research was performed to classify reasons for Army enlistment, and identify factors associated with enlistment in the Army or another Service. Data from two samples of FY72 Army enlistees were subjected to factor analysis and hierarchical cluster analysis techniques to generate a four-way classification of reasons for enlistment: vocational development, enlistment in the Service of one's choice (Army) at the time of one's choice, individual development and change, and military personnel benefits, including the G.I. Bill. The two factors most influential were educational level and race. (Modified author abstract)

AD-777 040/7GA PC$4.50/MF$1.45
Naval Training Equipment Center Orlando Fla Training Analysis and Evaluation Group
COMPUTER MANAGED INSTRUCTION IN NAVY TRAINING.
Final technical rept.,
Morris C. Middleton, Clarence J. Papetti, and Gene S. Micheli. Mar 74, 106p Rept no. TAEG-14

Descriptors: *Naval personnel, *Training, *Computer aided instruction, Individualized training, Shipboard, Centralized, Management, State of the art.

The report presents the findings of a six-month study undertaken to investigate the feasibility of Computer Managed Instruction (CMI) for the Navy in three areas: Large-scale centralized computer system for all formalized Navy training; minicomputers for small, remote classes; and use of shipboard computers for managing individual training aboard ships. (Modified author abstract)

AD-777 055/5GA PC$4.00/MF$1.45
Human Resources Research Organization Alexandria Va
THE STRUCTURE OF ENLISTMENT INCENTIVES.
Final rept. Jul 73-Mar 74,
Allan H. Fisher, Jr., Richard J. Orend, and Leslie S. Rigg. Mar 74, 78p Rept no. HumRRO-TR-74-6
Contract N00014-73-C-0430

Descriptors: *Military forces(United States), *Volunteers, *Recruiting, Factor analysis, Army,

Manpower, Research management, Personnel development, Education, Enlisted personnel, Training.
Identifiers: *Incentives.

The research identified a series of factor structures of enlistment incentives. A four-factor solution was found for the total sample: Self-determination; vocational training; enlistment bonus; and general education. The factor structure was generally replicated among market segments denoted as potential enlistees and non-enlistees. While the Army solution resembled the solution for the total sample, the Navy and Air Force solutions differed from this solution and from each other. (Modified author abstract)

COM-74-10640/2GA PC$4.00/MF$1.45
Maine Univ., Walpole. Marine Lab.
MARINE RELATED FILMS AVAILABLE FROM THE UNIVERSITY OF MAINE FILM RENTAL LIBRARY,
Paul D. Ring. 1973, 20p Maine-Sea-Grant-Leaflet-2 NOAA-74021104
Also pub. as Maine Univ., Walpole. Ira C. Darling Center for Research, Teaching and Service. Darling-Ref-73-9.

Descriptors: *Training films, *Oceanography, Education, Bibliographies, Earth sciences, Fishing, Ecology.
Identifiers: Sea Grant program.

Marine related films with informative annotations are listed along with information on their availability. Extension reports such as this one are provided by the Cooperative Extension Service of the University of Maine, Orono, and Fisheries Extension Service of the Maine Department of Sea and Shore Fisheries, Augusta.

COM-74-10723/6GA PC$21.25/MF$1.45
Battelle Columbus Labs., Ohio.
CHANGES IN LABOR FORCE PARTICIPATION, EMPLOYMENT AND IN-MIGRATION IN SUB-NATIONAL ECONOMIES.
Research rept.,
Seymour Goldstone, and Dennis Schiffel. Dec 71, 361p EDA/OER-73-036
Contract C-7-35384

Descriptors: *Population migrations, *Employment, *Manpower utilization, Demography, Education, Age, Sex, Unemployment, Surveys.

The report presents the results of a study which indicate that demographic comparisons of labor force participation rates are most fruitfully made on the basis of sex, age, educational attainment, presence of small children, race and marital status. Also that the most important demographic comparisons of groups employment (unemployment) rates are framed in terms of educational attainment, age, family status, sex and race. Demographic attributes indicated as significant for inmigration are primarily age, sex and educational attainment. It is typically the interaction of these characteristics that leads to widely varying labor market behavior.

COM-74-10726/9GA PC$7.25/MF$1.45
RAND Corp., Santa Monica, Calif.
PROBLEMS OF MODEL SPECIFICATION AND MEASUREMENT: THE LABOR SUPPLY FUNCTION,
David H. Greenberg. Dec 72, 85p R-1085-EDA EDA/OER-74-212
Grant EDA/OER-388-G-71-11

Descriptors: *Manpower, *Income, *Supply(Economics), Methodologies, Models, Social welfare, Cross sections, Sampling, Unemployment, Demography, Maintenance, Demand(Economics).
Identifiers: Income maintenance programs.

The report examines some of the advantages and disadvantages of different approaches using cross-sectional data in estimating the labor supply effects of alternative income maintenance programs (IMPS). It discusses the implications of making one methodological choice rather than another and points to areas, such as the selection of the sample population, where improved data or theory can contribute to improving labor supply estimates. Existing cross-sectional data sets are examined followed by a discussion on testing for regional differences in labor supply parameters. The report concludes by suggesting that an important step in obtaining improved labor supply estimates is to construct sensitivity tests to examine the empirical significance of using one methodology rather than another.

COM-74-90021/8GA PC-Free/MF$1.45
Office of Minority Business Enterprise, Washington, D.C.
REPORT OF THE TASK FORCE ON EDUCATION AND TRAINING FOR MINORITY BUSINESS ENTERPRISE.
Jan 74, 182p

Descriptors: *Management training, *Education, *Commerce, Ethnic groups, National government, State government, Local government, Management methods, Operations research, Evaluation.
Identifiers: *Minority owned enterprises.

The report points out that the alarming failure rate among small businesses is even higher for new business ventures started by minority group members. This failure rate is attributed primarily to the absence of managerial knowhow and technical skills. There is a need to bridge the management education and training gap that currently exists between minority and non-minority business owners. Reducing this educational disparity will require concentrated and coordinated efforts at the national, state and local levels. The recommendations contained in the Report call for increased support at the federal level, where few funds have been provided for education and training in conjunction with other minority enterprise programs. The Report calls on both the public and private sectors to combine efforts in making available the resources needed to improve and expand minority enterprise education and training.

JPRS-61315 PC$5.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
PSYCHOLOGICAL PROBLEMS IN THE REGULATION OF ACTIVITY,
D. A. Oshanin, and O. A. Konopkin. 25 Feb 74, 165p
Trans. of mono. Psikhologicheskie Voprosy Regulyatsii Deyatelnosti, Moscow, 1973 208p.

Descriptors: *Human behavior, *Industrial psychology, Job analysis, Automatic control, Self stimulation, USSR, Translations.

Contents: Psychological approach to investigation of the activity of a human operator; effectiveness of pattern of a controlled process; dynamics of operational patterns in tracking processes with extrapolation; dynamic image of a time-spatial structure; bioelectric correlates of individual differences; effects of structure of data panel on operator activity; effect of reducing the size of a nonfixed object; bioelectric correlates of operational adjustment; analysis of expectation state in the work of an operator in the chemical industry; effect of subjective evaluation of uncertainty with reference to duration of work on control of activity; man's ability to assess probability characteristics of alternative stimuli; and effect of exercise on response rate in recognition problems.

JRPS-61543 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
COSMONAUT TRAINING CENTER AND ZVEZDNYI GORODOK DESCRIBED,
A. Fedorov. 21 Mar 74, 9p
Trans. of 'From Zvezdnyi to the Stars' from Sovetskaya Rossiya (USSR) p3 4, 5, 7 Dec 73.

Descriptors: *Education, *Astronauts, *Physical fitness, Translations, USSR.
Identifiers: Zvezdnyy(USSR).

The city of Zvezdnyy is described and the life led there by cosmonauts. Special attention is given to the athletic facet of preparing a cosmonaut for space flight and their training regimes and facilities detailed in the first person by A. Fedarov as he tours the city.

N74-16846/9GA PC$7.25/MF$1.45
Washington Univ., St. Louis, Mo. Communications Group.
HOW TO MAKE THE FOURTH REVOLUTION: HUMAN FACTORS IN THE ADOPTION OF ELECTRONIC INSTRUCTIONAL AIDS.
N. J. Demerath, and L. A. Daniels. Dec 73, 85p NASA-CR-136862, MEMO-73/5
Contract NGR-26-008-054

Descriptors: *Education, *Human factors engineering, *Training devices, Communities, Culture (Social sciences), Electronic equipment, Psychological factors, Social factors.

For abstract, see STAR 1208

N74-17668/6GA PC$8.00/MF$1.45
Washington Univ., St. Louis, Mo. Center for Development Technology.
TECHNOLOGY IN THE PUBLIC SCHOOLS .
D. Lipman. Dec 73, 98p NASA-CR-136829, MEMO-73/6
Contract NGR-26-008-054

Descriptors: *Education, *Schools, *Technology utilization, Research projects, Students, Transfer of training.

For abstract, see STAR 1208

PB-229 481/7GA PC$5.50/MF$1.45
Institute of Society, Ethics and the Life Sciences, Hastings-on-Hudson, N.Y.
THE TEACHING OF MEDICAL ETHICS.
Final rept. 1 Jan 72-31 Aug 73,
Robert M. Veatch, Willard Gaylin, and Councilman Morgan. 1973, 198p* BHSRE-74-9
Grant HS-00832
Proceedings of a Conference Held at Columbia Univ., Coll. of Physicians and Surgeons, N.Y. on 1-3 Jun 72. Prepared in cooperation with Columbia Univ., N.Y.

Descriptors: *Medical personnel, *Ethics, *Education, *Meetings, Proceedings, Sociology, Values, Attitudes, Behavior, Social psychology.

Major advances in the medical sciences enable the physician to prolong life, detect genetic defects in the embryo, and transplant organs. The physician is also becoming increasingly involved in the social, economic, legal, and ethical problems that affect the health status of his patients and the community at large. Medical schools, to assure that their graduates meet these new charges responsibly, are expanding their curricula to include the social sciences and humanities, but, as yet, there is no concensus on subject matter or method of teaching. The papers in this proceedings define the sphere of medical ethics and discuss various teaching methods. Contents: Section 1. Medical Ethics Teaching: Its Nature and Range; section 2. Medical Ethics Teaching: Experimental Techniques; and section 3. Workshops on Issues in Medical Ethics.

PB-229 614/3GA PC$23.00/MF$1.45
Bryn Mawr Coll., Pa. Graduate School of Social Work and Social Research.

A STUDY ON THE DEVELOPMENT OF A NON-STANDARD WORK DAY OR WEEK FOR WOMEN.
Final rept.,
Ruth W. Prywes. 26 Feb 74, 396p DLMA-91-42-73-16-1
Grant DL-91-42-73-16

Descriptors: *Females, *Employment, Goverment policies, Industrial management, Labor unions, Manpower utilization, Questionnaires, Social welfare, Socioeconomic states, Statistical analysis, Supply(Economics), Surveys, Unskilled workers, Pennsylvania.
Identifiers: *Part time employment, Philadelphia(Pennsylvania).

This survey report contains findings on part-time work arrangements currently being offered by Greater Philadelphia SMSA employers to minimally-skilled women workers. Employer willingness to extend non-standard work arrangements and to establish the norm of steady employment in their establishments is reported. Employer opinions concerning business considerations involved in part-time hiring are reported. Attitudes of some SMSA union officials are also presented. SMSA employer attitudes concerning the social desirability of the employment of women who are heads-of-households is discussed as well as the social provisions currently being offered to facilitate employment. New legislation required to place part-time workers on a better footing economically is identified. Obstacles presented by Civil Service are reported upon. A review of the literature on part-time employment is included.

PB-229 937/8GA PC$6.50/MF$1.45
Texas Univ., Austin. Center for the Study of Human Resources.
A COMPARISON OF UNION CONSTRUCTION WORKERS WHO HAVE ACHIEVED JOURNEYMAN STATUS THROUGH APPRENTICESHIP AND OTHER MEANS.
Final rept.,
William S. Franklin, Robert W. Glover, and Ray Marshall. Dec 73, 254p DLMA-82-48-71-18-1
Contract DL-82-48-71-18

Descriptors: *Apprenticeship, *Employment, *Salaries, Construction industry, Craftsmen, Industrial relations, Industrial training, Job analysis, Labor relations, Upgrading, Males, Manpower utilization, Performance, Productivity, Statistical analysis, Surveys.

The authors sought mainly to determine the influence of apprenticeship on the employment and earnings of selected construction craftsmen and secondarily to learn how informally trained journeymen learned their trades. Six basic trades were studied -- bricklayers, carpenters, electrical workers, ironworkers, plumbers and pipefitters, and sheet metal workers -- in nine cities. Data emphatically support the hypothesis that apprenticeship graduates tend to work more than informally trained journeymen and that apprenticeship-trained craftsmen are more broadly trained and suffer less from unemployment than other journeymen. The case is not as strong, but the data also indicate that apprenticeship-trained men are relatively overrepresented in supervisory positions. The study also makes a number of recommendations for improving the apprenticeship system.

PB-229 979/0GA PC$5.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
A RATIONALE FOR GOVERNMENT INTERVENTION IN HOUSING: MINORITY CONSTRUCTION WORKERS AND CONTRACTORS ARE VICTIMS OF DISCRIMINATION,
J. Peter Mattila. 22 Jun 73, 40p HUD-PDR-111
Prepared by Ohio State Univ., Columbus. Paper 40 on National Housing Policy Study Papers. Background Studies. Volume 3. Revision of report dated 28 May 73.

Descriptors: *Manpower utilization, *Construction industry, *Apprenticeship, *Labor management relations, *Minorities, Attitudinal changes, Skilled workers, Contract awards, Discrimination, Housing starts, Negroes, Training programs, Legislation, Subsidies, Recommendations.
Identifiers: Government intervention, Spanish Americans, *Housing and urban development research.

Unions are seen as having played an important role in excluding minorities from the most skilled building trades. Outreach apprenticeship programs are discussed as a successful technique for increasing minority representation in recent years and are recommended to be continued and intensified. Quota and preferential treatment plans appear to have induced some token integration but have been of limited effectiveness because of loopholes in the rules. The problems of minority contractors, although difficult, appear to be similar to those faced by minority businessmen in general and independent of the problems of minority craftsmen.

PB-230 486/3GA PC$4.00/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
CHARACTERISTICS OF THE CULTURALLY DIFFERENT CLIENT, A GUIDE FOR THE REHABILITATION COUNSELOR.
Final rept.,
William R. Phelps. 1 Apr 74, 14p

Descriptors: *Vocational guidance, *Rehabilitation, *Socioeconomic status, Counseling, Cultural deprivation, Attitudes, Speech, Learning, Motivation.

The material focuses on the following areas: definition and purpose, some of the more common characteristics of the culturally different, counselor attitudes in serving the culturally different, counselor's knowledge of client's background, communication in the counseling relationship and client attitudes toward helping services. Some characteristics identified are deficient experiential background, language problems, learning problems, reception difficulties, motivation and self-concept deficits.

PB-230 487/1GA PC$4.25/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
VOCATIONAL REHABILITATION OF THE DISABLED PUBLIC OFFENDER. A GUIDE FOR THE REHABILITATION PRACTITIONER.
Final rept.,
William R. Phelps. 1 Apr 74, 21p

Descriptors: *Vocational guidance, *Rehabilitation, *Disabled persons, *Criminal offenders, Socioeconomic status, Psychology, Behavior therapy, Social welfare, Counseling, Alcoholism, Drug addiction, Plastic surgery.
Identifiers: Sheltered workshops, *Vocational rehabilitation.

The material presented herein covers the following areas and is written primarily for the rehabilitation practitioner; introduction of the problem; the 'values' problem; some characteristics of disabled offenders; implications for the counseling process; special problems in providing vocational rehabilitation services; the corrections setting; and the summary.

PB-230 758/9GA PC$3.05/MF$1.45
City Univ. of New York.
TRAINING POLICE AS SPECIALISTS IN FAMILY CRISIS INTERVENTION,
Morton Bard. May 70, 73p* LEAA-NI-70-1
Grant LEAA-157
Paper copy also available from GPO $1.05 as stock.

Descriptors: *Family relations, *Police, *Specialized training, Behavior, Community relations, Counseling, Crimes, Emotions, Mental hygiene.
Identifiers: *Crisis intervention.

This training was intended to demonstrate innovative methods of crime prevention and preventive mental health. The project attempted to modify family assaults and family homicides and to reduce personal danger to police officers in such situations. Assuming that family conflict may be an early sign of emotional disorder in one or all of the participants, the project attempted to utilize policemen as front-line casefinders in keeping with theories of primary prevention. It was proposed that selected policemen could be provided with interpersonal skills necessary to effect constructive outcomes in deteriorating situations which require police intervention. The program avoided the conversion of policemen into social workers or psychotherapists. The officers were expected to perform all generalized police patrol functions but were the individuals dispatched on all family disputes in a given geographical area. In addition to continuous group experience, each family specialist was assigned an individual consultant for at least one hour weekly consultation. The individual consultants were advanced clinical psychology students.

PB-230 911/0GA PC$4.75/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
SOME ASPECTS OF SEXUAL INTEGRATION OF MENTALLY RETARDED FEMALES IN A MULTIPLE DISABILITY REHABILITATION CENTER.
Interim rept. Jun 62-Jun 65,
William R. Phelps. Aug 65, 31p

Descriptors: *Mental deficiency, *Females, Evaluation, Placement, Handicapped workers, West Virginia.
Identifiers: *Vocational rehabilitation, *Prevocational centers.

The primary purposes and objectives of this project were to evaluate and provide pre-vocational conditioning for mentally retarded girls directed toward a goal of employment. This included an eight-week residential course at the W. Va. Rehabilitation Center and included sexual integration of the client population with other multiple disability groups. The program demonstrated the effectiveness of an organized approach of a delivery system for mentally retarded female clients. The population attempted to encompass a homogeneous grouping but through experience, changes were necessary to provide a more comprehensive, meaningful social-vocational program in the rehabilitation process. Follow-up services over time regarding rehabilitation outcome was provided by home visitation contacts through the services of a social worker.

PB-230 912/8GA PC$4.00/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
REHABILITATION COUNSELOR'S OPINION REGARDING THE EFFECTIVENESS OF SPECIAL PROJECT SERVICES FOR THE MENTALLY RETARDED.
Interim rept. Jun 62-Jun 65,
William R. Phelps. Aug 62, 19p

Descriptors: *Mental deficiency, *Females, Adults, Counseling, Evaluation, West Virginia.
Identifiers: *Prevocational centers, *Vocational rehabilitation.

The purpose of this study was to evaluate how rehabilitation counselors felt about the usefulness and effectiveness of a special project program for young adult mentally retarded females. The majority of the rehabilitation counselors (85%) felt that clients receiving special project services were easier to work with as compared with other men-

tally retarded clients in their caseloads. The relationship between selected rehabilitation counselor variables (age, education, length of time employed) and the number of rehabilitated mentally retarded clients for fiscal year 1963-64 in West Va. was investigated and none of these factors were found to be significant. The findings are of value in developing appropriate curricula and reporting methods for the mentally retarded, young adult female.

PB-230 913/6GA PC$4.25/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
WORK PLACEMENT SUCCESS FOR MENTALLY RETARDED FEMALES.
Interim rept. Jun 62-Jun 65,
William R. Phelps. Aug 65, 21p

Descriptors: *Mental deficiency, *Females, Counseling, Evaluation, West Virginia.
Identifiers: *Prevocational centers, *Vocational rehabilitation.

Comparisons between groups of 49 rehabilitated and 40 non-rehabilitated midly mentally retarded, young, adult females identified five variables to be significant in relationship to successful work placement. Professional staff agreement (including rehabilitation counselors) concerning suitability for work placement, social adjustment and vocational adjustment of the client, and the level of aspiration of the mentally retarded females were all significant. Seven factors were found to be nonsignificant in predicting success or failure; namely, family residence, family income, parental attitudes, client attitudes, parental evaluation of client change, emotional problems of client, and exposure to education training. Implications point to the need for a twelve to eighteen month program for a personal and social adjustment training for the midly mentally retarded, prior to embarking upon advance vocational training and/or placement activities.

PB-230 971/4GA PC$5.50/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Economics.
MANPOWER ECONOMIC EDUCATION AND THE TRANSITION FROM SCHOOL TO WORK (IMPACT ON A COHORT OF OHIO SECONDARY SCHOOL STUDENTS).
Final rept. 1 Feb 73-28 Feb 74,
Robert L. Darcy, Richard V. Kauffman, and Edward P. Milker. Feb 74, 190p DLMA-21-08-73-29
Grant DL-21-08-73-29

Descriptors: *Employment, *Education, *Labor unions, Attitudes, Economic analysis, Job satisfaction, Manpower, Orientation(Training), Schools, Socioeconomic status, Students, Surveys, Vocational guidance.
Identifiers: Dropouts, Youth programs.

Using longitudinal data the impact of an experimental manpower economics course on world-of-work understanding, attitudes, education-related and employment-related behavior was studied. While the 8th-grade course (given fall semester 1967-68) had significant short-run impact on understanding and attitudes of instructional students compared with control students matched for mental ability, few longer-run differences were observed between the groups during high school and as of the February 1973 survey week eight months following graduation. Surprisingly, wage rates and weekly pay were not associated with scores on a test of world-of-work understanding or with IQ, academic rank in high school, family income, and other variables, but were positively associated with labor union membership. Major differences were observed between graduates and dropouts.

5J. Psychology (Individual and Group Behavior)

AD-776 309/7GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
RESPONSES OF MILITARY RESERVISTS IN TWO SIMULATED CRISES.
Master's thesis,
Richard S. Elster. Feb 74, 27p Rept no. NPS-55EA74021A

Descriptors: *Military personnel, *Students, *Performance(Human), *Stress(Psychology), Assessment, Test methods, Universities, Theses, Statistical data.
Identifiers: *Crisis decision making, *Reservists.

Responses of military reservists in two simulated crises situations are presented and compared with the responses made by college students in experiments conducted by other researchers at Columbia University. Statistical methods are used to compare the responses of single reservists with those of groups of reservists. The results are then compared with those from the students at Columbia. (Author)

AD-776 313/9GA PC$3.75/MF$1.45
Naval Postgraduate School Monterey Calif
AN ANALYSIS OF THE RELATIONSHIP AMONG MEDITATION, PERSONALITY TYPE AND CONTROL OF BRAIN WAVE PRODUCTION.
Master's thesis,
Nguyen Van. Sep 73, 56p*

Descriptors: *Brain, *Personality, Waves, Creativity, Parapsychology, Theses, Electroencephalography, Psychophysiology.
Identifiers: *Transcendental mediation, *Biofeedback, Psychosomatic disorders, Alpha waves, Jung.

In recent years scientists in every nation have come to realize that voluntary control of behavior is of primary importance if one hopes to establish an ordered society or even to maintain a society. Meditation has been known and practiced by Asian people, especially Indians, for many hundreds of years. With the aid of the biofeedback technique, it is believed that the study of altered states of consciousness, creativity, parapsychology, personality type, psychosomatic medicine, therapy, and education, etc., could be greatly enhanced. The paper is concerned with the interrelationship among meditation, personality type and brain wave production using biofeedback techniques. Emphasis is placed on the effect of meditation on personality type changes. (Modified author abstract)

AD-776 332/9GA PC$3.00/MF$1.45
Purdue Univ Lafayette Ind
AGGRESSIVENESS AND PERFORMANCE IN A MINI-SYSTEM CONTEXT.
Final rept.,
Mark W. Stephens, Don Nelson, and Gerald A. Hudgens. Feb 74, 15p HEL-TM-4-74

Descriptors: *Performance(Human), *Stress(Psychology), *Learning, Human factors engineering, Psychological tests, Assessment.
Identifiers: *Aggressiveness, Aggression.

Four experiments were conducted to test the hypothesis that aggressive disposition and/or past reinforcement for aggressive responses disrupts performance in stressful situations which require new learning. Four different human subject populations were used: pre-school children, college males, college football players, and teenage ghetto gang members. Several measures of aggressiveness were obtained and evaluated, and various performance tasks were tried. No strong evidence was obtained to support the original hypothesis. However, measures of 'internal-external control expectancies' were found to correlate significantly with performance and, therefore, may be useful for predicting individuals' future performance in stressful situations. (Author)

AD-776 373/3GA PC$3.25/MF$1.45
Army Aeromedical Research Lab Fort Rucker Ala
INSTRUMENT FLIGHT PREFERENCE AND FIELD DEPENDENCE,
Eric R. George, and Mark A. Hofmann. Jan 74, 38p Rept no. USAARL-74-8

Descriptors: *Instrument flight, *Pilots, *Attitudes(Psychology), Questionnaires, Interviewing, Correlation techniques, Analysis of variance, Demography, Perception.
Identifiers: *Rod and frame tests, *Instrument flight rules, Field independence, Preferences, Verticality perception.

Research is reported on the possible relationship between field dependence-independence, as measured by the rod and frame test (RFT), and aviator attitudes regarding IFR flight. The degree of aviator preference for actual instrument flight, determined by questionnaires and personal interviews, served as the basis for division of an aviator sample of 43 pilots into high and low preference groups. These groups were examined relative to each of the three field dependency measures derived from RFT performance. In addition, demographic data of both subject groups were reduced and examined. (Modified author abstract)

AD-776 381/6GA PC$3.75/MF$1.45
Human Resources Research Organization Alexandria Va
DETECTION OF HUMAN TARGETS.
Technical rept.,
James A. Caviness, and Jeffrey L. Maxey. Feb 74, 52p Rept no. HumRRO-TR-74-4
Contract DAHC19-73-C-0004

Descriptors: *Performance(Human), *Target detection, Infantry, Army personnel, Small arms, Targets, Motion, Illumination, Sizes(Dimensions), Terrain.

A study of detection performance by infantrymen for human targets under optimal lightining and line-of-sight conditions was conducted to obtain data for the Army Small Arms Requirements Study (ASARS). Four classes of variables were studied: target, environmental, organismic, and experimental. Results indicated that illumination intensity, target lighting, target size, target speed, target contrast with environment, terrain, observer height, observer movement, and observer experience are important determinants of detection. Results demonstrated a need to further examine the interactions among these determinants when some or all of them are varied at one time. (Author)

AD-776 629/8GA PC$3.25/MF$1.45
West Virginia Univ., Morgantown. Dept. of Sociology and Anthropology.
SCIENTISTS AND CREW: A CASE STUDY IN COMMUNICATIONS AT SEA. 2. THE SOCIAL EFFICIENCY OF CONFLICT ABOARD AN OCEANOGRAPHIC RESEARCH VESSEL,
H. R. Bernard, Peter D. Killworth, and Anne Collins. 1 Apr 74, 35p BK-103-74
Contract N00014-73-A-0417-0001
Prepared in cooperation with Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.

Descriptors: *Group dynamics, *Shipboard, *Scientists, *Crews, *Conflict, Behavior, Sociology, Research ships.

Elements of conflict between scientists and crew on a research vessel are described. It is suggested that conflict between these two groups is the inevitable result of extending the 'intellectual'/'worker' class conflict of our society to a closed space at sea. The controlling

mechanism of the conflict may be called 'subcultural privacy,' a mechanism worked out by mariners to cope with the disrupting effects of a constant stream of strangers into their sea-going home. The mechanism takes the form of institutionalized 'bitching' and systematic physical separation of scientists and crew during critical periods of the day. It is suggested that attempts to create greater crew/scientist harmony by forcing greater interaction (and thus a breakdown of subcultural privacy) will be counterproductive. (Author)

AD-776 633/0GA PC$3.75/MF$1.45
Florida Univ Gainesville Coll of Business Administration
IDENTIFYING AND DEVELOPING LEADERSHIP ASPECTS OF EFFECTIVE MANAGEMENT IN TEAM-ORIENTED TASK GROUPS.
Technical rept.,
William M. Fox. 1 Mar 74, 53p Rept no. TR-70-4
Contract N00014-68-A-0173-0010

Descriptors: *Leadership, *Management, *Group dynamics, Models, Organization theory, Surveys, Training, Cooperation, Interactions, Task forces.

Leadership is distinguished from management. A review of key leadership studies is presented. Data on leadership styles are presented and problems in studying them are discussed. A normative model for leadership of team-oriented task groups based upon current research findings is presented. Documented lead-lag relationships between leader behaviors and various outcomes are examined. Managerial potential for behavior change and feedback approaches for effecting change toward the normative behaviors are discussed. (Some sixty references to relevant research studies are given). (Author)

AD-776 656/1GA PC$4.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
BIBLIOGRAPHY OF PAPERS AND REPORTS RELATED TO THE GUST UPSET/PILOT DISORIENTATION PROBLEMS,
Clifford F. Newberry. Feb 74, 20p Rept no. AGARD-616
NATO furnished.

Descriptors: *Bibliographies, *Clear air turbulence, *Pilots, *Stress(Psychology), *Space perception, Gusts, Errors, Aviation accidents, Proprioception, Aircraft, Maneuverability, Aerodynamic loading, Aviation medicine.
Identifiers: *Disorientation.

The report is a compilation of papers and reports that have been issued relating to the problem of an airplane being upset from atmospheric disturbances and the pilot being disorientated as a result of the upset. This report lists the published papers that were known and available to the Working Group Coordinator. There undoubtedly exists a number of excellent papers that have not come to the Coordinator's attention and, therefore, the bibliography should not be considered to be exhaustive. The report lists the papers by title and report number and wherein a summary was available, the summary is also provided.

AD-776 659/5GA PC$6.50/MF$1.45
California Univ Berkeley Dept of Architecture
METHODS FOR THE DEVELOPMENT OF SHIPBOARD HABITABILITY DESIGN CRITERIA. BIBLIOGRAPHY ON HABITABILITY WITH ABSTRACTS.
Technical rept. no. 1, 1 May 72-30 Sep 73,
Sami Hassid, Craig McArt, and Hugo Blasdel. Oct 73, 263p*
Contract N00014-69-A-0200-1058

Descriptors: *Bibliographies, *Shipboard, *Habitability, *Environmental engineering, Scaling factors, Group dynamics, Seats, Noise, Light, Heat, Abstracts.

The bibliography on habitability was developed as part of a research project on 'Methods for the Development of Shipboard Habitability Design Criteria.' The bibliography attempts to surveys the methodology and results of habitability research with a particular emphasis on new methods. Abstracts are provided for a large number of entries which are organized into the following chapters: multidimensional scaling; single attribute scaling; perception, modeling techniques; small group interaction; subjective responses to color; seating comfort; noise, light; and thermal environment. (Author)

AD-776 666/0GA PC$4.00/MF$1.45
Western Michigan Univ Kalamazoo Dept of Psychology
THE EXPERIMENTAL ANALYSIS OF AGGRESSION.
Final rept.,
Roger E. Ulrich. Mar 74, 94p
Contract N00014-67-A-0421-0001

Descriptors: *Behavior, Conditioned response, Reaction(Psychology).
Identifiers: *Experimental psychology, *Aggression.

An overview of the experimental analysis of nonhuman and human aggression is presented. The causes and modification of aggression in nonhuman and human animals are studied. Also presented is a summary of the implications of the reviewed research for the control of human aggression.

AD-776 669/4GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
PSYCHIATRIC CRISIS AND ENLISTMENT MOTIVATION,
Darrel Edwards, Steven F. Bucky, and Newell H. Berry. Apr 73, 4p Rept no. NMNRU-73-27
Availability: Pub. in U. S. Navy Medicine, v63 p24-25 Mar 74.

Descriptors: *Psychology, *Volunteers, Naval personnel.
Identifiers: *Draftees.

The study investigated psychiatric ineffectiveness under an all-volunteer simulated structure: among draft-motivated and self-motivated enlistees. Enlistees who joined the Navy in 1970 or 1971 with the highest third of draft numbers in the lottery were classified as self-motivated. Those men who joined the Navy in 1970 or 1971 after receiving the lowest third of lottery numbers were selected as draft motivated. The self-motivated group had a 2.12 percent incidence rate, and the draft-motivated group had a 2.80 percent incidence rate. The self-motivated group who became psychiatric cases were diagnosed psychosis or neurosis almost twice as often as the draft-motivated group, but they were diagnosed with drug-related problems half as often as the self-motivated group. Characterological problems and transient, specific, organic, or psychophysical problems were relatively stable. (Author)

AD-776 692/6GA Reprint
Istituto Nazionale Di Ottica Florence (Italy)
THE PERIPHERAL DIPLOPIA, IN THE FRAME OF RECENT VIEWS ON THE ORGANIZATION OF THE VISUAL SYSTEM,
Lucia Ronchi. 1973, 15p Rept no. Ser-2-1531 EOARD-TR-74-5
Grant AF-AFOSR-2409-72
Summary in Italian.
Availability: Pub. in Atti della Fondazione Giorgio Ronchi, v28 n6 p943-955 Nov/Dec 73.

Descriptors: *Visual perception, Visual acuity, Visual defects, Electrophysiology, Psychophysiology, Electroretinography, Italy.
Identifiers: Diplopia, *Peripheral vision.

A single test-object is found to evoke two distinct sensations, in peripheral vision. The conspicuity of this effect depends on the degree of training of the observer. It is tentatively ascribed to the multiplicity of detectors and to their spatial arrangement, which, seems to result in two systems with different time constants. (Author)

AD-776 693/4GA Reprint
Istituto Nazionale Di Ottica Florence (Italy)
ERG, VER, VISUO-MOTOR REACTION TIME AND LIGHT SENSITIVITY UNDER PROLONGED CYCLICAL STIMULATION,
Lucia Ronchi, and Felicita Pedata. 1973, 14p Rept no. Ser-2-1535 EOARD-TR-74-6
Grant AF-AFOSR-2409-72
Summary in Italian.
Availability: Pub. in Atti della Fondazione Giorgio Ronchi v28 n6 p972-983 Nov/Dec 73.

Descriptors: *Vigilance, *Visual perception, Performance(Human), Stimulation(Physiology), Conditioning(Learning), Light, Sensitivity, Electroretinography, Eye, Italy.
Identifiers: Visual evoked responses.

The time change of responsiveness, under prolonger monotonous cylical stimulation, is found to follow the same trend across the visual pathway. A strong inter-session variability is noticed. It is as if there were a periodical shift of the sensitivity level. It might be ascribed to a long-term time change of pupil size, under continuous watchkeeping. (Modified author abstract)

AD-776 778/3GA PC$3.25/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
VARIABLES RELATED TO PRE-SERVICE CANNABIS USE IN A SAMPLE OF AIR FORCE ENLISTEES,
Cecil J. Mullins, Bart M. Vitola, and Alan E. Michelson. Nov 73, 43p Rept no. AFHRS-TR-73-33

Descriptors: *Drug abuse, *Cannabis, Statistical analysis, Sampling, Surveys, Attitudes(Psychology), Performance(Human), Age, Demography, Aptitudes, Religion.

A sample of 4564 self-admitted cannabis users was compared with a sample of airmen who had no known record of drug abuse. This study indicates that there is a very strong likelihood for cannabis users to use other drugs. There are relationships between cannabis abuse and geographic area of enlistment, religious preference, aptitude scores, race, educational level, and age at enlistment. Cannabis abuse is also related to the likelihood of getting an undesirable discharge, to Airman Performance Report, and to promotion rate. (Author)

AD-776 786/6GA PC$8.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio
EFFECTIVE TECHNICAL COMMUNICATIONS COPY PREPARATION AND REPRODUCTION. EXPERIMENT II.
Technical rept.,
Richard M. Davis. Feb 74, 98p Rept no. AFIT-TR-74-4 AU-4-74-AFIT-EN

Descriptors: *Reading, *Perception(Psychology), Skills, Intelligibility, Education, Students.
Identifiers: *Comprehension, Legibility, Technical writing.

The effects of three variables in the copy preparation and reproduction of a written technical message upon the effectiveness of the message were tested on five definably different audiences in a 2x2x2 factorial experiment. The message was a 2563-word passage describing a simple mechanical device and containing nine line drawings. The variables tested were margins (straight or ragged), corrections (clean or sloppy), and reproducton (clean or dirty). The effectiveness of the message

was measured by a comprehension test, reading time, judgments of the author's knowledge of his subject, and judgments of the author's competence as a writer. The five audiences (total subjects-764) were drawn from the student bodies at Central State University, Sam Houston State University, the University of Dayton Technical Institute, the General Motors Institute, and the School of Engineering of the Air Force Institute of Technology. They were contrasted on the basis of age, intelligence, technical inclination, and experience in the use of written technical communications. (Modified author abstract)

AD-913 426/3GA PC$4.50/MF$1.45
Army War Coll., Carlisle Barracks, Pa.
AN INVESTIGATION OF NONVERBAL COMMUNICATION.
Research paper,
Bernard D. Wheeler, and Paul R. Hammock. Mar 72, 27p
Distribution Limitation now Removed.

Descriptors: *Body, *Language, Reaction(Psychology), Responses, Scientific research, Training, Attention.
Identifiers: *Kinesics, *Nonverbal communications, *Body language, *Gestures, Julius fast.

The report discusses nonverbal communication, kinetics, and its relationship to the spoken word. It is shown how body language relates to some of the various professions such as law, politics, teaching, and psychiatry. Everyone is constantly involved in nonverbal communications. The body does not know how to lie. All movement, all gestures and expressions, whether natural or practice, have meaning and will either reinforce or belie the spoken word. (Modified author abstract)

N74-16822/0GA PC$4.25/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
EXPERIMENTAL RESTRAINT ULCER IN THE WHITE RAT. 3: STUDY AND ANALYSIS OF THE PART PLAYED BY CERTAIN PSYCHOLOGICAL FACTORS.
S. Bonfils, G. Liefooghe, X. Gelle, M. Dubrasquet, and A. Lambling. Feb 74, 25p NASA-TT-F-15329
Contract NASW-2482
Tran-Transl. Into English from Rev. Fr. Etud. Clin. Biol. (France), V. 5, 1960 p 571-581.

Descriptors: *Gastrointestinal system, *Immobilization, *Rats, *Ulcers, Inertia, Pathological effects, Physiological responses, Psychosomatics.

For abstract, see STAR 1208

PB-230 383/2GA PC$3.00/MF$1.45
Human Resources Research Organization, Alexandria, Va.
PROCEEDINGS OF WORKSHOP ON REGIONAL DRUG ABUSE PROGRAMMING, OCTOBER 1973.
Professional paper.
Jan 74, 18p HumPRO-PP-1-74

Descriptors: *Drugs, *Project planning, *Meetings, Regional planning, Treatment, Models, Federal programs, Recommendations, State planning, Prevention, Methodology.
Identifiers: *Drug abuse, *Interagency cooperation.

A workshop on regional drug abuse programming was called to investigate the need for a federally-supported model, stressing inter-agency coordination, to be employed by states as a guide for establishing substate area programs, and to explore other questions related to programs for drug abuse prevention and treatment. The organization of state and substate planning, the direction of service delivery, and the interface between state and substate or local programs were discussed by the participants. Specific recommendations are included in the report.

PB-230 496/2GA PC$4.00/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
WASHTENAW COUNTY 1971, 1972 AND 1973 BAC (BLOOD ALCOHOL CONCENTRATION) ROADSIDE SURVEYS.
Final rept.,
Cheryl D. Clark, Marion J. Compton, Richard L. Douglas, and Lyle D. Filkins. Aug 73, 78p UM-HSRI-AL-73-6

Descriptors: *Motor vehicle operators, *Alcoholism, Surveys, Interviews, Michigan.
Identifiers: *Alcohol usage, *Driver characteristics, *Blood alcohol levels, Drinking drivers, Nondrinking drivers, Washtenaw County(Michigan).

Three roadside surveys of drivers in Washtenaw County, Michigan were conducted in March of 1971, 1972 and 1973. The surveys were an integral part of the evaluation procedures for the Washtenaw County Alcohol Safety Action Program (WCASAP) and were designed to obtain representative samples of nighttime driving residents. Forty-eight time-location cells were defined throughout the county based on time of night, day or week, traffic volume and location. Drivers were sampled from 7-9PM, 10-12PM and from 1-3AM on each of four nights for four consecutive weeks. A short on-site interview was obtained from participating drivers as well as a breath specimen, used to determine blood alcohol concentration (BAC). Survey sample sizes included 748 drivers in 1971, 1023 in 1972 and 847 in 1973. The distributions of drivers are given by BAC and demographic variables, drinking.

PB-230 776/7GA PC$5.50/MF$1.45
System Development Corp., Santa Monica, Calif.
THE ROLE OF VISION AND AUDITION IN TRUCK AND BUS DRIVING.
Final rept.,
Robert L. Henderson, and Albert Burg. 30 Dec 73, 180p SDC-TM-L-5260/000/00
Contract FH-11-7923

Descriptors: *Visual acuity, *Auditory perception, *Motor vehicle operators, Accidents, Physiology, Performance tests, Trucks, Buses(Vehicles), Evaluation, Traffic safety, Statistical analysis.

A systematic analysis was made of the visual and auditory requirement of commercial carrier driving, based upon a review of the scientific literature, a detailed examination of the driving task, and observations of and interviews with qualified drivers. As a result of this analysis, new visual performance measures dealing with perception of motion and dynamic performance of the total visual system were identified as important to driving. A device was designed and constructed that provided the capability of testing performance on these new visual performance parameters as well as on selected conventional measures.

PB-230 973/0GA PC$4.75/MF$1.45
City Univ. of New York.
POLICE FAMILY CRISIS INTERVENTION AND CONFLICT MANAGEMENT. AN ACTION RESEARCH ANALYSIS,
Morton Bard. Apr 72, 231p
Contract LEAA-NI-70-068

Descriptors: *Police, *Family relations, Conflict, Community relations, Education, Attitudes.
Identifiers: *Crisis intervention.

A study is presented of two methods of resolving personal and family disputes by police in low income housing projects and by precinct crisis intervention units. In addition to the analysis of the variables that make for disputes in which police are called upon to intervene, the study addressed itself to an examination of general police performance of conflict management trained officers, attitudes of the community toward the police where conflict management trained officers were operating, the effects of training upon the police and their function, and, the relationship of the trainees to their training consultants.

5K. Sociology

COM-71-80004-54/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. HOUSEHOLD INCOME IN 1969 FOR STATES, SMSA'S, CITIES, AND COUNTIES: 1970.
Supplementary rept.
Jun 73, 58p CENSUS-70-PC(S1)-54
Paper copy available from GPO $0.75 as C3.223/12:970/54.

Descriptors: *Census, *United States, *Income, Tables(Data), Standard metropolitan statistical areas, Counties, Regions.

The report presents statistics on household income in the United States during 1969. Data are shown for the United States, regions, divisions, States, standard metropolitan statistical areas, cities of 25,000 or more (or central cities), and counties. The statistics were derived from a special tabulation of 1970 census data which also included a cross-classification of household income by size of household, tenure, and race of head.

COM-71-80004-56/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SELECTED CHARACTERISTICS OF THE POPULATION IN LOW-INCOME AREAS OF LARGE CITIES: 1970.
Oct 73, 31p CENSUS-70-PC(S1)-56
Paper copy available from GPO $0.45 as C3.223/12:970/56.

Descriptors: *Census, *United States, Tables(Data), Population characteristics, Housing characteristics, Income level, Poverty areas, Low income areas.

The report summarizes information on the population and housing characteristics of low-income areas in the 50 largest cities of the United States. Comparable data are also presented for the entire city and the portion of the city outside the low-income areas. Tables in the report present data on the population (all races, white, Negro, and persons of Spanish language) in census tracts with a poverty rate of 20 percent or more. Data are cross-classified by selected socioeconomic characteristics and selected housing characteristics.

COM-71-80015-19/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF HOUSING: 1970. INCOME OF HOMEOWNERS OF MORTGAGED PROPERTIES ACQUIRED IN 1967-1971, FOR THE UNITED STATES: 1971.
Supplementary rept.
Jun 73, 8p CENSUS-70-HC(S1)-19
Paper copy available from GPO $0.20 as C3.224/8:970/19.

Descriptors: *Housing census, *United States, Income level, Mortgage finance, Tables(Data).

The report provides data on the income of homeowners who acquired one-unit mortgaged properties during the period 1967 through the early part of 1971. Data for the United States on these properties are arranged by mortgage characteristics, mortgage payments and other expenses, property characteristics, and owner characteristics. Definitions of terms used in the report are included along with a discussion on the reliability of the estimates. The data presented in the report are extracted from Volume V of the 1970 Census of Housing, Residential Finance.

COM-74-10684/0GA PC$4.50/MF$1.45
California Univ., Berkeley. Inst. of Urban and Regional Development.
NATIONAL INTERREGIONAL DEMOGRAPHIC ACCOUNTS: A PROTOTYPE,
William Alonso. Feb 73, 120p* Monograph-17
EDA/OER-74-204
Grant EDA-OER-151-G-72-6
Errata sheet inserted.

Descriptors: *Demography, *Regional population, Mathematical models, Population migrations, Regional planning.

The report describes the concepts of a novel statistical and mathematical treatment of demographic variables, called a system of National Interregional Demographic Accounts. A brief, nontechnical overview of the model's relations, and the sense of some of the projections and policy experiments that may be tried, and the output of the model and its usefulness is presented.

COM-74-10722/8GA PC$15.50/MF$1.45
National Bureau of Standards, Washington, D.C.
RESEARCH STUDY ON THE SOCIO-ECONOMIC ASPECTS OF LOW-COST HOUSING IN THE PHILLIPPINES.
Final rept.
May 72, 250p NBS-GCR-73-21
Prepared in Sycip, Goores, Velayo and Co., Manila, Philippines. Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Housing studies, *Philippines, Typhoons, Damage, Demographic surveys, Economic surveys, Low cost housing, Community facilities, Housing starts, Climate influence, Household composition, Construction practices, Building codes, Socioeconomic conditions.

The report presents a survey of the historical occurrence of damages by typhoons, selected comparative indices for climate and housing construction, and an economic profile of the Philippines, as well as a regional demographic profile. A discussion is also presented on size and density of household dwelling units, trends in housing space expansion, community and municipal facilities; household income and household expenditures; financing sources for housing construction; availability and prices of construction materials and of labor; the capabilities of the housing industries; public reaction to new designs and materials; methods of housing construction; and building codes.

COM-74-70002-1503/GA
Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. SPECIAL CENSUSES. SPECIAL CENSUS OF ARLINGTON HEIGHTS, ILLINOIS, JUNE 23, 1972.
Sep 73, 10p P-28/1503
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25.

Descriptors: *Census, *Illinois, Tables(Data), Population characteristics.

The report presents the results of a special census conducted by the Bureau of the Census for the village of Arlington Hts., Cook and Lake Counties, Ill. This census was taken at the request and expense of the above named area and presents data on the population as of June 23, 1972. Statistics show a summary of changes in the composition of the population by race and sex, and data on age, race, and sex for the area and the census tracts. A map on census tracts in Arlington Heights, Illinois is included.

COM-74-70002-1504/GA
Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. SPECIAL CENSUSES. SPECIAL CENSUS OF ELGIN, ILLINOIS, AUGUST 11, 1972.
Sep 73, 12p P-28/1504
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25.

Descriptors: *Census, *Illinois, Tables(Data), Population characteristics.

The report presents the results of a special census conducted by the Bureau of the Census for the city of Elgin, Cook and Kane Counties, Illinois. This census was taken at the request and expense of the above named area and presents data on the population as of August 11, 1972. Statistics show a summary of changes in the composition of the population by race and sex, and data on age, race, and sex for the area and the census tracts. A map on census tracts in Elgin, Illinois is included.

COM-74-70002-1505/GA
Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. SPECIAL CENSUSES. SPECIAL CENSUS OF PASCO COUNTY, FLORIDA, MARCH 21, 1973.
Oct 73, 3p P-28/1505
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25.

Descriptors: *Census, *Florida, Tables(Data), Population characteristics.

The report presents the results of a special census conducted by the Bureau of the Census for Pasco County, Florida. This census was taken at the request and expense of the above named area and presents data on the population as of March 21, 1973. Statistics show a summary of changes in the composition of the population by race and sex, and data on age, race, and sex for the area and the census tracts. A map on census tracts in Pasco County, Florida is included.

COM-74-70002-1506/GA
Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. SPECIAL CENSUSES. SPECIAL CENSUS OF FORT SMITH, ARKANSAS, JULY 13, 1973.
Sep 73, 11p P-28/1506
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25.

Descriptors: *Census, *Arkansas, Tables(Data), Population characteristics.

The report presents the results of a special census conducted by the Bureau of the Census for Fort Smith, Arkansas. This census was taken at the request and expense of the above named area and presents data on the population as of July 13, 1973. Statistics show a summary of changes in the composition of the population by race and sex, and data on age, race, and sex for the area and the census tracts. A map on census tracts in Fort Smith, Arkansas is included.

COM-74-70004-250/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. PERSONS OF SPANISH ORIGIN IN THE UNITED STATES: MARCH 1972 AND 1971.
Apr 73, 41p P-20/250
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65 as C3.186:P-20, $1.25/copy as C3.186:P-20/250.

Descriptors: *Census, *United States, Tables(Data), Population characteristics, Socioeconomic status, Spanish language.

The report provides statistics on the demographic, social, and economic characteristics of persons who identified themselves as being of Mexican, Puerto Rican, Cuban, and Central or South American, or other Spanish origin in the United States. The data are based on a survey conducted in March 1972 and March 1971. Tables show data for persons of Spanish origin 14 years old and over, cross-classified by one or more of the following: age, sex, use of Spanish language in the home, marital status, size of families, educational attainment, employment status, metropolitan-nonmetropolitan residence, occupation group, and income. Data are for the United States, with selected data shown for the five southwestern States.

COM-74-70005-46/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. THE SOCIAL AND ECONOMIC STATUS OF THE BLACK POPULATION IN THE UNITED STATES, 1972.
Special studies.
Jul 73, 122p P-23/46
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65 as $2.25/copy C3.186:P-23/46.

Descriptors: *Census, *Ethnic groups, *United States, *Socioeconomic status.

The statistics provide information on the general, social, and economic characteristics of the black population in the United States. Data are from the 1970 Census of Population and Housing and the Current Population Survey (CPS), and other governmental and private sources. The report focuses on the changes which have occurred within the last five years, but include data for selected years between 1970 and 1972. Statistics are presented on population distribution, income, employment, education, family, housing, health, and voter registration. The data are shown for the total United States, regions, standard metropolitan statistical areas, and inside and outside metropolitan areas.

COM-74-70006-499/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF THE UNITED STATES AND COMPONENTS OF CHANGE: 1972 (WITH ANNUAL DATA FROM 1930).
May 73, 18p P-25/499
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (smmaries only), P-60 and P-65 as C3.186:P-25, $0.45/copy as C3.186P-25/499.

Descriptors: *Census, *United States, *Population estimates, Tables(Data), Vital statistics, Demographic surveys.

The report shows estimates of the population of the United States and components of change during 1972, with annual data from 1930. Estimates are consistent with the official 1970 resident population count. The 1960 and 1970 intercensal estimates are provisional and will be revised when final estimates of the components of change for the intercensal period become available. Text tables show: annual rates of net growth, births, deaths, and net immigration, 1930 to 1972; annual estimates of the general fertility rate, 1930 to 1972; components of population change, by type of population, 1950 to 1960, 1960 to 1970, and 1970 to 1973; estimates of the population, by type, at semiannual intervals, 1960 to 1973.

COM-74-70006-500/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF STATES, BY AGE: JULY 1, 1971 AND 1972.
May 73, 6p P-25/500

Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65 as C3.186: P-25 $0.25/copy as C3.186:P-25/500.

Descriptors: *Census, *United States, Tables(Data), Regions.

The report presents estimates of the resident population of States, by broad age groups for July 1, 1971, and provisional estimates for July 1, 1972. The age groups shown are: under 5 years, 5 to 17 years, 18 to 44 years, 45 to 64 years, and 65 years and over, plus, the cumulative age groups 14 years and over, 18 years and over, and 21 years and over. Estimates are also shown for the population of Standard Federal Regions for 1972, 1971, and 1970.

COM-74-70006-505/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF METROPOLITAN AREAS, 1971 AND 1972.
Sep 73, 26p P-25/505
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-24 (summaries only), P-60 and P-65 as C3.186: P-25, $0.55/copy as C3.186:P-25/505.

Descriptors: *Census, *United States, Tables(Data), Standard metropolitan statistical areas, Population estimates.

The report contains population estimates for July 1, 1971 and provisional estimates for July 1, 1972 for standard metropolitan statistical areas (SMSA's) and their constituent counties as currently defined by the Office of Management and Budget, including all changes since the 1970 census. Tables in the report show data on: Estimates of the population of SMSA's and their constituent counties, July 1, 1971 and July 1, 1972; metropolitan areas by population rank size, 1970; and estimates of the population of metropolitan areas, July 1, 1972, by population size class. An appendix provides county estimates published in Series P-26, Federal-State Cooperative Programs for Population Estimates for 1971 and 1972.

COM-74-70006-508/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF STATES: JULY 1, 1972 AND 1973 (ADVANCE REPORT).
Nov 73, 3p P-25/508
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65 as C3.186: P-25, $0.25/copy as C3.186:P-25/500.

Descriptors: *Census, *United States, Tables(Data), Population estimates.

The report presents revised estimates of the population of states for July 1, 1972, and provisional estimates for July 1, 1973. Figures are shown by regions, divisions, and States, for the resident and civilian populations. The 1972 estimates supersede the provisional 1972 numbers published in Current Population Reports, Series P-25, No. 488.

JPRS-61424 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
INTERACTION OF THE NATURAL AND SOCIAL SCIENCES AT THE CURRENT STAGE,
L. V. Kantorovich, B. G. Kuznetsov, and A. I. Berg. 7 Mar 74, 22p
Trans. of Voprosy Filosofii (USSR) n10 p39-53 1973.

Descriptors: *Social sciences, Engineering, Physics, Chemistry, Translations, USSR, Psychology, Evaluation.
Identifiers: *Physical scientists.

A round table discussion on the interaction between natural and social scientists in light of Marxist-Leninist doctrine is presented. Topics discussed are: The interpenetration of natural and social sciences; the cultivation of needs; cooperation between the natural and the social sciences; interaction between natural and social scientists as necessary for saving the environment; the development of the social sciences; the connection between psychology and the natural and social sciences; and the interrelations of the sciences.

PB-227 672/6GA PC$4.25/MF$1.45
Wisconsin Univ., Madison. Inst. for Environmental Studies.
OUTDOOR RECREATIONAL MANAGEMENT: A MATHEMATICAL MODEL,
Mark D. Menchik. Aug 73, 22p IES-Working Paper-12 NSF-RA/E-73-007
Grant NSF-GI-29731

Descriptors: *Recreational facilities, Policies, Mathematical models, Ecology.

The paper formulates and evaluates outdoor recreational management policies. The mathematical programming model developed allocates the use of a given system of outdoor recreational facilities so as to maximize a measure of user satisfaction without exceeding site carrying capacities.

PB-229 612/7GA PC$9.00/MF$1.45
Maryland Governor's Commission on Law Enforcement and the Administration of Justice.
COMPREHENSIVE PLAN, 1974. VOLUME 2.
Criminal justice rept.
1 Jan 74, 438p LEAA-MD-74-007
Grant LEAA-74-P-424
See also PB-228 779.

Descriptors: *Law enforcement, *Criminology, Police, Grants, Juvenile delinquency, Project planning, Project management, Financing.
Identifiers: Correctional institutions, Criminal justice, Courts of law.

The Plan is intended to form the basis for improvements in both the adult and juvenile justice system. It has been designed to place emphasis on reducing crime and improving the ons of the system. The Commission's long range projections for improvements are outlined. The five-year funding objectives and their priorities are presented. Allocation of grant funds is presented with a description of the annual action grants program for 1974. The Commission's multi-year funding program and its anticipated accomplishments are described. The progress of programs funded between 1969 and 1973 is discussed in conjunction with plans for evaluating each.

PB-229 728/1GA PC$3.75/MF$1.45
National Council on Crime and Delinquency, Davis, Calif. Research Center.
ALTERNATIVE PROGRAMS: A GRAPEVINE SURVEY,
Charmian D. Knowles. Mar 73, 75p*
Contract BNDD-73-8

Descriptors: *Community relations, *Education, Treatment, Drugs, Juvenile delinquents, Employment, Police, Counseling, Recreation.
Identifiers: *Drug abuse, *Criminal justice.

The initial contacts for this survey were drawn from among the participants in the First Alternatives to Drug Abuse Conference. They were asked to recommend exemplary programs in the areas of education, criminal justice, and community involvement which held promise for success in preventing or treating drug abuse. Subsequent referrals, in conjunction with a literature search, produced a concensus concerning the most successful programs. Those programs are cited in this booklet, under general headings, with a brief description, the program address, and the name of a person to contact for information. The programs all share the common objectives of building a better home life, creating a more stimulating school environment, and providing a community with ample opportunities for recreation and youth employment.

PB-229 878/4GA PC$53.00/MF$1.45
National Association for State Information Systems, Lexington, Ky.
1972 DIRECTORY OF AUTOMATED CRIMINAL JUSTICE INFORMATION SYSTEMS.
Dec 72, 1058p
Grant LEAA-72-SS-99-3000

Descriptors: *Directories, *Information systems, *Law enforcement, Police, Management systems.
Identifiers: *Criminal justice, Courts of law, Correctional institutions, Theft.

The directory contains an indexed listing of the automated criminal justice information systems used by police, courts, corrections and other agencies. Each listing briefly describes systems which are operational or being developed, who is doing the work and the current status of the systems. Approximately 454 separately defined systems are represented. The directory will aid people working with criminal justice information systems to establish communications with each other. It is set up to identify and describe all of the specific criminal justice functions being served by various information systems. Hardware and software information, general financial data and other information about each system are included. The names of contacts who can provide more information are listed for each system.

PB-229 888/3GA PC$6.50/MF$1.45
Miller, Mihry and Lee, Inc., Louisville, Ky.
PROTOTYPE SITE DESIGN AND RELATED SERVICES, MEMPHIS, TENNESSEE. OPERATION BREAKTHROUGH.
Final rept.
24 Jan 74, 67p
Contract HUD-H-1201

Descriptors: *Urban planning, *Technology innovation, *Central city, *Housing planning, Industrialization, Open space studies, High rise apartments, Noise abatement, Garden cities, Pedestrian movement, Tennessee, Site surveys, Construction practices.
Identifiers: *Housing and urban development research, Breakthrough operation, *Memphis(Tennessee), Conventional construction, Townhouses.

The report describes a combined demonstration of innovative site planning for a 15.9 acre inner city site and the utilization of 518 dwelling units of industrialized housing and conventional housing in a mixture of high-rise, garden apartments and townhouse units. The design concept is based on orientation of all structures toward an internally created environment of open space. The site planning demonstrates how an urban site, subject to noise pollution from surrounding highways, can be properly designed to prevent the major infiltration of highway noise into the site.

PB-229 913/9GA PC$9.50/MF$1.45
Main Dept. of Health and Welfare, Augusta.
MAINE MODEL STATE PROJECT. NATION-WIDE DEMONSTRATION PROGRAM FOR COMPUTER BASED SOCIAL INFORMATION SYSTEMS.
Final rept.,
Dean Fisher. 1 Jan 73, 130p NDP-EPR-ME-2-PW OIS-OSSO-IM-74-1

Descriptors: *Urban planning, *Information systems, Maine, Social welfare, Public health, Income, Data processing systems, Systems analysis, Input, Forms(Paper), Data acquisition.
Identifiers: Vocational rehabilitation.

The report includes examples of forms for income maintenance, social services, vocational rehabilitation and medical assistance programs that have been developed as input to a computer based social information system.

PB-229 940/2GA PC$6.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
A RATIONALE FOR GOVERNMENT INTERVENTION IN HOUSING,
Wallace F. Smith. 27 Jun 73, 59p HUD-PDR-130
Prepared by California Univ., Berkeley. Revision of report dated 1 Jun 73. Paper 3 on National Housing Policy Study Papers. Background Studies. Volume 2.

Descriptors: *Federal housing programs, *Government services, Relocation, Defects, Family relations, Recommendations, Economic factors.
Identifiers: *Housing and urban development research.

The federal commitment to housing remains poorly defined as to minimum shelter quality and the quantity or scope of the effort. Involvement has been mainly reactive to emerging special needs, rather than directed to basic reforms of the housing market. Assistance to families displaced by urban renewal and highway programs has moved to the provision of social casework assistance and special-purpose housing. Critical problems arise, when public works agencies are required to perform social casework functions. An alternative approach is suggested.

PB-229 970/9GA PC$7.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
A RATIONALE FOR GOVERNMENT INTERVENTION IN HOUSING: THE EXTERNALITIES GENERATED BY GOOD HOUSING,
Jerome Rothenberg. 28 Jun 73, 81p HUD-PDR-138
Prepared by Massachusetts Inst. of Tech., Cambridge, Mass. Paper 28 on National Housing Policy Study Papers. Background Studies. Volume 3.

Descriptors: *Housing characteristics, *Welfare economics, *Federal policies, *Quality of life, Factor analysis, Neighborhoods, Substandard housing, Quality control, Social welfare, Interaction, Impact.
Identifiers: *Government intervention, *Housing and urban development research.

The paper stresses multi-dimensionality of the housing package, and how that multi-dimensionality affects both the understanding of good and bad housing and the welfare consequences of such conditions. The report sketches out the kinds of welfare impact each facet of housing is likely to have. There is an important interplay of housing structure variables, like space and condition, with one another as well as with lot and neighborhood aspects of the housing package. In the overall welfare impact of bad housing, concentrations of adverse circumstances among the several facets of housing are likely to occur, where population and structure and neighborhood mutually aggravate the negative externalities that impinge on wellbeing. These are the cases for which government intervention are recommended.

PB-230 006/9GA PC$9.25/MF$1.45
Mentoris Co., Sacramento, Calif.
A STUDY OF EMERGENCY RESPONSE SYSTEM FOR HOUSING FOR THE AGED. VOLUME I.
Final rept.,
E. Smith, and W. J. Schimandle. Aug 73, 125p
Contract HUD-H-2025

Descriptors: *Emergency preparedness, *Housing for the aged, *Warning systems, Evaluation, Fire alarm systems, Manual controls, Intercom systems, Personnel, Management methods, Sociopsychological surveys, Transfer of technology.
Identifiers: Pushbutton systems, Confidence, *Housing and urban development research.

The report presents results of a HUD sponsored evaluation of an emergency response system-hardware systems including fire alarms, intercoms, mobile or push button alarms and such software systems as procedures and the response staff in housing for the elderly; its effectiveness, applications, and transferability to similar facilities. Attitudinal, behavioral, emergency occurrence, management, operational, design, and cost data were gathered on a mobile alarm system (SCAN) installed at Sacramento Breakthrough site. Comparative data were gathered on a wall push-button system.

PB-230 030/9GA PC$5.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
THE ROLE OF NEW CONSTRUCTION SUBSIDIES IN NATIONAL HOUSING POLICY,
Benjamin Chinitz. 18 Jun 73, 44p HUD-PDR-125
Paper 13 on National Housing Policy Study Papers. Background Studies. Volume 2.

Descriptors: *Housing studies, *Subsidized construction, *Federal housing programs, Reviews, Substandard housing, Government policies, Requirements, Demand(Economics), Management methods, Objectives.
Identifiers: Housing policies, *Housing and urban development research.

Supply site intervention via subsidies to new construction has been a major policy instrument to reduce incidence of substandard housing in the U.S. The paper reviews data on housing quality, the rationale for policy and implied goals, and the rationale and experience of specific policies, especially those entailing subsidies to new construction of public and private housing. In light of current preference for demand side strategies and emphasis on existing stock, the author explores the potential need for and relevance of new construction strategies, concluding they remain essential but must be seen in a different light and take on new objectives.

PB-230 057/2GA PC$4.75/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
APPROPRIATE ROLE OF GOVERNMENT IN HOUSING,
Bernard Saffran. 1973, 31p HUD-PDR-119
Prepared by Swarthmore Coll., Pa. Paper 1 on National Housing Policy Study Papers. Background Studies. Volume 1.

Descriptors: *Housing planning, *Federal programs, *Government policies, *Reviews, Effectiveness, Defects, Urban renewal, Substandard housing, Income redistribution, Evaluation, Recommendations.
Identifiers: *Housing and urban development research.

The initial impetus of the Government's commitment to massive housing and urban rehabilitation programs was largely humanitarian and based on the widely held observation that families with inadequate housing were often prey to the problems of poverty, crime and bad health. A national housing policy was regarded as a useful, although partial, solutions for problems of the poor. Housing programs, as well as other social programs that give consumer's specific products, are now widely believed to have been largely unsuccessful and are under attack. The paper deals with issues raised by the critics and evaluates arguments and proposals for government intervention in the housing sector largely from the perspective of welfare economics.

PB-230 058/0GA PC$9.50/MF$1.45
Smith (James D.), State College, Pa.
HOUSING EXPENDITURES, 1970,
James D. Smith, and Beverly A. Politzer. 4 Jul 73, 128p HUD-PDR-132
Contract HUD-H-2107
Paper 56 on National Housing Policy Study Papers. Background Studies. Volume 4.

Descriptors: *Housing studies, *Demographic surveys, *Economic studies, Family income, Family relations, Rental payments, Residential buildings, Quality, Ratios, Pattern statistics.
Identifiers: *Housing and urban development research, Rent income ratios.

The report presents some facts about the manner in which families and individuals spend their income for housing, and the effect of alternative spending patterns on the quality of housing obtained. A considerable amount of attention is focused on the proportion of income which families spend on rent, the ratio of rent to family income. This quantity is used to identify population groups which have high rent income ratios.

PB-230 189/3GA PC$5.75/MF$1.45
Rutgers-The State Univ., New Brunswick, N.J. Center for Urban Policy Research.
ANALYSIS OF NEIGHBORHOOD DECLINE IN URBAN AREAS.
George Sternlieb, and James Hughes. Jun 73, 223p* HUD-PDR-307

Descriptors: *Neighborhoods, *Deterioration, *Urban areas, *Central city, Factor analysis, Blighted areas, Increasing, Economic factors, Demography, Social conditions, Economic models, Reviews.

After 20 years of urban renewal and large flows of housing in recent years, it appears that the resources expended by federal housing efforts have been largely unsuccessful in dealing with high rates of deterioration and abandonment of housing in the central city. The processes of decay, neighborhood evolution, and decline which are noted in the report seem to have been altered minimally by federal efforts. Implications are discussed.

PB-230 190/1GA PC$5.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
ANALYSIS OF THE RELATIONSHIP BETWEEN RELOCATION AND REHABILITATION.
Final rept.,
Arthur R. Hessel. 11 Jun 73, 50p HUD-PDR-306
Prepared by Frosh, Lane and Edson, P.C., Washington, D.C.

Descriptors: *Housing studies, Housing legislation, Rehabilitation, Relocation.
Identifiers: *Housing and urban development research.

The paper provides some historical background concerning relocation as related to project rehab. and more particularly to the Boston Rehabilitation Program; emphasis is given to the human and social problems of relocation. The Uniform Relocation Act is discussed in depth, including the legal and legislative challenges to the proposition that the Act does not apply to the normal FHA project. Specific relocation activities in Project Rehab cities are then examined.

PB-230 191/9GA PC$4.75/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
PUBLIC RESPONSES TO SEVERAL INCREASINGLY IMPORTANT AND NEWER FORMS OF HOUSING.
National housing policy study papers,

Susan Anderson, and Richard Coleman. 21 Sep 73, 34p HUD-PDR-120-c

Descriptors: *Housing studies, *Consumer preferences, *Consumer buying expectations, Interviews, Kansas, Trends, Condominium housing, Prefabricated housing, Mobile homes, Objectives, Socioeconomic status, Attitudes, Blue collar workers.
Identifiers: Kansas City(Missouri), *Housing and urban development research.

The memorandum on supplements the joint center's recent report to HUD, housing goals for the U.S. The purpose is to report findings on consumer reactions to specified newer forms of housing during interviews with Kansas City residents in late 1972. The analysis indicates trends in consumer aspirations and preferences which may affect the way the housing needs forecast in the main report will be met. These trends include condominium living, factory-built or prefab homes, and mobile homes as a viable alternative to conventional houses for senior years and transient periods.

PB-230 210/7GA PC$7.75/MF$1.45
Trans Urban East Organization, Inc., New York.
A STUDY TO ANALYZE THE IMPACT OF MINORITY PARTICIPATION OF ALTERNATE HOUSING SUBSIDY PROGRAMS, AND THEIR RESULTING RACIAL AND ECONOMIC DISPERSION.
4 Aug 73, 95p HUD-PDR-404
Contract HUD-H-2117R

Descriptors: *Housing planning, *Subsidy programs, *Economically disadvantaged minorities, *Government policies, Reviews, Dispersions, Impact, Effectiveness, Community development, State programs, Recommendations.
Identifiers: *Housing and urban development research.

The study has focused on the concerns of minorities and the poor with regard to national housing subsidy strategies. The results of past programs and the impact of new strategies on minority participation, racial and economic dispersion have been examined. The study's basic conclusions are presented with regard to racial dispersion policies, minority participation in the community development process, direct housing assistance strategy, and a greater role for states in housing subsidy programs.

PB-230 231/3GA PC$12.50/MF$1.45
Thompson (J. Neils), P. E., Austin, Tex.
ASSESSMENT OF THE CHARACTER OF HOUSING TECHNOLOGY AND INDUSTRIALIZATION. VOLUME II,
J. Neils Thompson. 15 Jun 73, 188p HUD-PDR-002
Contract HUD-H-2082

Descriptors: *Housing studies, *Industrialization, *Technological advancement, *Federal programs, Reviews, Policies, Recommendations, Modular housing, Prefabricated housing, Mobile homes, Self help housing, Cost analysis, Building codes.
Identifiers: Conventional construction, *Housing and urban development research.

The report sets forth the author's view of selected aspects of housing technology and housing industrialization in the United States for consideration by HUD during its current housing policy review. The report emphasizes what the government could or should do for housing technology and industrialization in the form of recommendations and discussions of those recommendations.

PB-230 232/1GA PC$4.50/MF$1.45
Public Response Co., San Francisco, Calif.
SURVEY AND TECHNICAL ASSISTANCE TO THE HUD HOUSING STUDY TASK FORCE.
Final rept.
Jun 73, 33p HUD-PDR-202
Contract HUD-H-2068

Descriptors: *Housing studies, *Statistical methods, Sampling, Production costs, Multiunit housing, Failure, Benefit cost analysis, Technical assistance.
Identifiers: *Housing and urban development research.

The report is primarily a statistical study, divided into two sections. Section 1 details the sampling plan. Random samples were taken of production costs, multi-family failures, and a filtration study sample, statistically analyzed along with three different samples for a beneficiary study. Section 2 outlines the additional technical assistance provided.

PB-230 236/2GA PC$4.75/MF$1.45
Westat, Inc., Rockville, Md. Research Div.
CONSUMER CHARACTERISTICS IN THE SOUTHERN RURAL HOUSING MARKET.
Final rept.,
Robert T. Learmonth, and Stephen F. Dietz. 21 Jun 73, 35p HUD-PDR-103

Descriptors: *Rural occupied housing units, *Home ownership, *Rental housing, *Southern states, Consumer patterns, Housing studies, Statistical data, Loans, Mobility, Consumer preferences, Federal programs, Facilities, Mobile homes, Housing market.
Identifiers: *Housing and urban development research.

Descriptive statistics are presented for housing owners and renters in southern rural areas. Statistical tabulations and narrative summary are presented for these eight major categories of consumer characteristics: Housing loan experience; moving history, moving intentions and dwelling preferences; present housing; financial; prospective uses of housing allowance; Farmers Home Administration; rural facilities; and mobile homes.

PB-230 239/6GA PC$12.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
SECTION 236 SUBSIDY ANALYSIS.
Final rept.
Jun 73, 180p HUD-PDR-305

Descriptors: *Rental payments, *Subsidy programs, *Formulas(Mathematics), *Income level, Economic analysis, Expenses, Operating costs, Statistical methods, Reviews, Federal housing programs.
Identifiers: Alternatives, Phaseout, *Housing and urban development research.

Under the Sec. 236 subsidy formula, a tenant pays a 'basic rent' based on project economics or 25% of his adjusted income, whichever is greater; in no event does the tenant pay more than 'market rent' which is the economic rent in the absence of any subsidies. Hence, as tenant incomes increase over a project's life, the subsidy commitment may be reduced. However, basic rents may also increase as operating expenses and taxes increase, thus offsetting the subsidy phaseout. The analysis, therefore, tests the effect of alternative tenant income versus operating expense increases.

PB-230 303/0GA PC$4.50/MF$1.45
Massachusetts Governor's Committee on Law Enforcement and Criminal Justice, Boston.
IMPROVING POLICE/COMMUNITY RELATIONS - PRESCRIPTIVE PACKAGE,
Robert Wasserman, Michael Gardner, and Alana S. Cohen. Jun 73, 123p*
Grant LEAA-72-DF-01-0028

Descriptors: *Police, *Community relations, Project planning, Handbooks, Improvement, Methodology, Sociopsychological surveys, Interviews, Reviews, Policies, Attitudes, Management methods, Recommendations.
Identifiers: Conflict resolution, Innovations.

The handbook is one of a series of prescriptive packages intended to provide criminal justice administrators with both background information and operational guidelines in selected program areas. The report represents an effort to identify various police operational and organizational practices specifically aimed at the improvement of police-community relations. Through site visits, personal interviews and a survey of the available literature, the author became acquainted with various innovative programs aimed at improving police-community relations. The general strategy recommended emphasizes the need for stressing improved community relations in all major police activities.

PB-230 372/5GA PC$10.50/MF$1.45
Potomac Inst., Inc., Washington, D.C.
LAND USE CONTROLS AS A BARRIER TO HOUSING ASSISTANCE.
Final rept.,
Herbert M. Franklin. 20 Jun 73, 149p HUD-PDR-425
Contract HUD-H-2094

Descriptors: *Low income housing, *Federal policies, *Land use controls, Constraints, Revisions, Low income groups, Housing characteristics, Mobility, State programs, Zoning regulations, Local government, Metropolitan areas, Regional planning, Revenue sharing, Community development, Legislation.
Identifiers: *Housing and urban development research.

An analysis is made of potential policies that could be pursued by HUD and other agencies and departments of the federal government to overcome or moderate land use controls and related barriers to greater residential mobility of lower income households. The report does not presuppose any specific form of federal housing subsidies. It is organized around certain state, local and HUD programs relevant to this objective as well as possible programs and policies of other agencies of the federal government.

PB-230 432/7GA PC$23.00/MF$1.45
Louis, Bowles and Grove, Inc., Dallas, Tex.
FILTERING EFFECTS OF SUBSIDIZED RURAL HOUSING. VOLUME II.
Final rept.,
20 Jul 73, 400p HUD-PDR-205-b
Contract HUD-H-2088

Descriptors: *Housing studies, *Rural occupied housing units, *Subsidies, *Statewide statistics, Tables(Data), Computer aided evaluation, Missouri, South Carolina, Texas, Mississippi, Interviews.
Identifiers: Beneficiaries, Computer printouts, *Housing and urban development research.

The volume presents detailed computer tabulations of findings from separate surveys in each of four states, followed by combined tabulations of findings for direct subsidy beneficiaries versus indirect beneficiaries.

PB-230 434/3GA PC$7.50/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, pa. Dept. of Civil Engineering.
RIVERINE RECREATIONAL DEVELOPMENT. MATHEMATICAL MODELING.
Interim research rept.,
Richard M. Shane, Harold J. Day, Samuel Mark Frenkil, and Peter Hin Pung Ho. 1 Sep 73, 90p
R735-5 W74-05958, OWRR-C-2183(3381)(1)

Descriptors: *Water quality, *Recreational facilities, Swimming, Fishing, Boats, Mathematical models, Computerized simulation, Surveys, Urban planning, Pennsylvania.
Identifiers: Pittsburgh(Pennsylvania).

A computer simulation model is developed to make water quality projections for planning urban recreation. One of the goals of this research is to

evaluate the recreational potential of the Allegheny River, particularly that portion closest to the city of Pittsburgh. The present water quality of the Allegheny River is suitable for boating and general fishing; but it is not suitable for swimming or active game fishing at this time.

PB-230 467/3GA PC$4.75/MF$1.45
Chicago Univ., Ill.
THE LABOR COMPONENT IN THE COST OF HOUSING.
Draft rept.,
John P. Gould. Jul 73, 34p HUD-PDR-424
Revision of report dated Jun 73.

Descriptors: *Housing studies, *Federal policies, *Labor, Costs, Production forecasts.
Identifiers: *Housing and urban development research.

The document presents an analysis of the impact of Federal policies towards labor which affect housing costs and production. Specific recommendations for changes in Federal policies are spelled out.

PB-230 641/3GA PC$4.50/MF$1.45
Urban Inst., Washington, D.C.
THE DIVISION OF RESPONSIBILITY FOR HOUSING POLICY IN A FEDERAL SYSTEM OF GOVERNMENT.
Working paper,
Richard E. Wagner. Jun 73, 27p UI-116-91 HUD-PDR-007-b
Contract HUD-H-2114
Paper 7 on National Housing Policy Study Papers. Background Studies. Volume 2.

Descriptors: *Housing studies, *Housing market, *Policies, State government, Local government, Federal programs, Management methods, National housing goals, Failure, Recommendations.
Identifiers: Government intervention, *Housing and urban development research, Responsibility levels.

The paper examines possible rationales for government intervention in the housing market, paying attention to the problem of specifying the level of government appropriate for housing policy. The sections examine primary rationales, paying attention to how each relates to the division of responsibility between federal, state, and local governments. The paper discusses federal intervention as a last resort when states or localities fail to act in areas of local concern.

PB-230 696/7GA PC$5.00/MF$1.45
Utah Univ., Salt Lake City. Dept. of Economics.
AN ANALYSIS OF SOCIAL CRITERIA AND TRIGGERING MECHANISMS FOR EXTENDED UNEMPLOYMENT BENEFITS.
Final rept. Mar 73-Mar 74,
James Dean Van Erden. Mar 74, 160p DLMA-91-49-73-25-1
Contract DL-91-49-73-25

Descriptors: *Unemployment, *Manpower, *Economic models, Applications of mathematics, Social welfare, Insurance, Payment, Markov chains, Evaluation, Legislation, Benefit plans, Theses.

This dissertation attempts to establish and develop suitable criteria for evaluating the performance of trigger mechanisms for determining extended benefit periods. A review of the current law is made as well as a brief summary of legislation leading to its passage. A quantitative model using concepts from the Theory of Markov Chains is established which meets established criteria. This model is then fully developed and discussed with respect to variations in the economy and their impact on the model. The model, itself, may be used as a trigger or may be used as a guide by which to evalute other trigger mechanisms.

PB-230 939/1GA PC$3.25/MF$1.45
North Carolina Univ., Chapel Hill. Mecklenburg Criminal Justice Pilot Project.
MECKLENBURG CRIMINAL JUSTICE PILOT PROJECT. ANNOTATED LIST OF PUBLICATIONS. REVISED EDITION,
Virginia Rollett. 1974, 27p MCJPP-71-Rev
Contract LEAA-NI-73-04-0002
See also PB-223 423.

Descriptors: *Crimes, *Drug addiction, *Bibliographies, Abstracts, Contracts, Grants, North Carolina, Law enforcement.
Identifiers: Mecklenburg County(North Carolina), Criminal justice.

The report is an annotated bibliography prepared by the project staff concerning drug abuse, research instruments, progress evaluations, and applications for LEAA funds.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-776 644/7GA Reprint
Naval Medical Research Inst Bethesda Md
CHROMATOGRAPHY OF RARE BASIC AMINO ACIDS.
Medical research progress rept. no. 19,
Robert W. Longton, Vincent J. Berzinskas, Aram Y. Balekuian, and Saul B. Needleman. 23 Aug 73, 6p
Revision of report dated 29 Mar 73.
Availability: Pub. in Analytical Biochemistry, v57 p343-346 1974.

Descriptors: *Amino acids, *Chromatographic analysis, Separation.
Identifiers: Lysine.

L-Ornithine, l-lysine, alpha, gamma-diaminobutyric acid, and alpha, beta-diaminopropionic acid were separated chromatographically on PA 35 in the presence of amino acids normally present in protein hydrolysates or physiological fluids. The resolution of these components in the mixture was excellent. The content of these lower homologs of lysine can be quantitatively determined by means of the chromatography. (Author)

AD-776 833/6GA Reprint
Children'S Hospital Medical Center Boston Mass Dept of Neurology
THE EFFECT OF PEROXIDIZED ARACHIDONIC ACID UPON HUMAN PLATELET AGGREGATION,
Hubert S. Mickel, and Jeffrey Horbar. 1 Aug 73, 7p
Contract N00014-72-0059, Grant PHS-HD-09704
Sponsored in part by Grant PHS-HD-03773 and PHS-HD-10098. Prepared in cooperation with Harvard Medical School, Boston, Mass.
Availability: Pub. in Lipids, v9 n2 p68-71 1974.

Descriptors: *Blood platelets, *Blood coagulation, *Fatty acids, Peroxides, Lipids.
Identifiers: *Arachidonic acid, Prostaglandins.

Human platelet aggregation was studied in vitro following exposure to free arachidonic acid and peroxidized arachidonic acid. A slow aggregation response was caused by free arachidonic acid, whereas a rapid, marked response resulted from exposure to peroxidized free arachidonic acid. Aggregation resulting from peroxidized arachidonic acid was not counteracted by adenosine nor by prostaglandin E(1), both in high concentrations. Peroxide-induced platelet aggregation required the presence of added calcium ions in vitro. The aggregation resulting from exposure to peroxidized arachidonic acid was abolished by prior treatment of the lipid peroxide with tocopherol and butylated hydroxy toluene. (Author)

AD-776 845/0GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
SELENIUM AND HEPATIC MICROSOMAL HEMOPROTEINS,
Raymond F. Burk, A. M. Mackinnon, and F. R. Simon. 16 Nov 73, 6p
Availability: Pub. in Biochemical and Biophysical Research Communications, v56 n2 p431-436 1974.

Descriptors: *Selenium, *Liver, *Microsomes, Proteins, Cytoplasm, Diet, Nutrition.

Although selenium is considered an essential element for many species, little is known of its specific biochemical function in animals except that it is a constituent of glutathione peroxidase. The report describes a selective incorporation of selenium into hepatic microsomes of selenium-deficient rats and impaired phenobarbital induction of cytochromes P-450 and b5 in these animals. These data suggest that selenium may have an important role in hepatic microsomal function.

AD-776 846/8GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
THE RAPID CHANGES OF HEPATIC GLYCOLYTIC ENZYMES AND FRUCTOSE-1,6-DIPHOSPHATASE ACTIVITIES AFTER INTRAVENOUS GLUCAGON IN HUMANS,
H. L. Greene, O. D. Taunton, F. B. Stifel, and R. H. Herman. 10 Aug 73, 9p
Availability: Pub. in the Jnl. of Clinical Investigation, v53 n1 p44-51 Jan 74.

Descriptors: *Glucagon, *Phosphatases, *Enzymes, Deficiencies, Glycolysis, Metabolic diseases, Liver, Parenteral infusions.

The authors studied the acute effects of intravenous glucagon on human hepatic enzyme activities and cyclic AMP concentrations in eight patients with various types of hepatic enzyme deficiencies.

AD-777 003/5GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
STIMULATION OF PROTEIN SYNTHESIS IN NORMAL AND TUMOR CELLS BY AGENTS MODIFYING THE CELL SURFACE,
V. A. Artamonova, L. K. Kiselev, Z. N. Tikhonova, V. Ya. Shlevyagin, and L. G. Kiseleva. 1974, 17p
Trans. of Tsitologiya (USSR) n14 p1260-1266 1972.

Descriptors: *Neoplasms, Proteins, In vivo analysis, Cells(Biology), Biosynthesis, USSR, Translations, Membranes(Biology), Amino acids, Stimulation(Physiology), Viruses, Chemicals.
Identifiers: *Protein biosynthesis.

The report discusses the study of the intensity of protein synthesis in cells of various origin (both malignant and normal), by the inclusion of C14 of amino acids in the acid-insoluble fraction. For agents modifying the cell surface, several substances having little in common were chosen: inactivated Sendai parainfluenza virus (complex nucleoprotein), DEAE-dextran (polysaccharide containing diethylaminoethyl groups with postive charge), dimethylsulfoxide (organic solvent of simple structure-DMSO), and Tween 80 (incomplete detergent containing hydrocarbon chains). As a result of tests run in the present study, it has been established that the agents used raise the rate of protein synthesis in intact cells.

AD-777 011/8GA PC$3.25/MF$1.45
Battelle Columbus Labs Ohio
DEVELOPMENT OF FLUORESCENCE BASED SYSTEMS FOR DETECTION OF MORPHINE IN URINE.
Annual rept.,
David A. Knowlton, Maynard B. Neher, and David L. Marshall. 29 Mar 74, 41p
Contract DADA17-73-C-3038

Descriptors: *Urine, *Morphine, *Fluorescence, Chemical analysis, Opium alkaloids, Detection, Body fluids.

The report contains the results of efforts toward devising an improved method for fluorescent determination of morphine in urine. One of the initial problems investigated was a method for hydrolysis of morphine-3-glucuronide in urine without loss of morphine free base. The morphine-3-glucuronide was isolated from dog urine after intravenous administration of morphine sulfate to a beagle dog. Experiments were carried out to hydrolyze the morphine-3-glucuronide with beta-glucuronidase in solution and also with beta-glucuronidase immobilized on glass beads in a column. A number of fluorescent morphine derivatives were synthesized. These were evaluated with respect to ease of preparation, fluorescence quantum yield of product, excitation wavelength, emission, wavelength, cost of reagents and stability of reagents and product. (Author)

BNL-18364 PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
PROGRESS IN DESIGNING SMALL INHIBITORS WHICH DISCRIMINATE AMONG TRYPSIN-LIKE ENZYMES.
E. Shaw. 1973, 25p CONF-731055-1

Descriptors: (*Enzymes, *Inactivation), Inhibition, Ketones, Labelling, Trypsin.

For abstract, see NSA 29 07, number 17978.

PATENT-3 745 088 Not available NTIS
Department of Agriculture, Washington, D.C.
ACTIVE WATER-INSOLUBLE ENZYMES.
Patent,
Charles L. Mehltretter, and Francis B. Weakley.
Filed 23 Dec 70, patented 10 Jul 73, 3p PAT-APPL-101 134,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Enzymes, Preparation, Solubility, Water.
Identifiers: PAT-CL-195-63.

The invention relates to water-insoluble enzymes and their preparation. More specifically, it relates to the chemical coupling of an enzyme to diazotized starch anthranilate. The instant enzyme composition is especially suited for enzymatic processes in which it is desirable to remove essentially all of the enzyme from the desired product (e.g., chill proofing of beer).

SGAE-2163 PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Inst. Fuer Biologie.
PURINE SALVAGE IN SPLEEN CELLS.
G. Partsch, H. Altmann, and R. Eberl. Sep 73, 13p CONF-730674-1
U.S. Sales Only.

Descriptors: (*Purines, *Biochemical reaction kinetics), (*Spleen cells, Biochemical reaction kinetics), Carbon 14, Deoxyribose, Enzymes, Guanine, Hypoxanthine, Mice, Nucleosides, Tracer techniques.

For abstract, see NSA 29 07, number 17994.

6B. Bioengineering

AD-776 308/9GA PC$5.50/MF$1.45
Naval Postgraduate School Monterey Calif
A DIVER MONITOR SYSTEM.
Master's thesis,
John D. M. Hamilton. Dec 73, 46p

Descriptors: *Divers, *Acoustic tracking, Monitoring, Physiology, Heart, Transmitters, Acoustic tracking, Theses, Sonar, Electrocardiography, Diving, Telemeter systems.
Identifiers: *Biotelemetry.

A system is presented which allows continuous monitoring of a free-swimming diver. The Diver Monitor System (DMS) employs a diver-carried acoustic transmitter which transmits pulses synchronized with the diver's heartbeat. Surface personnel are able to minotor the diver's general physical state as indicated by his heart rate and, by directional homing with Navy hand-held sonar, can locate and recover divers in zero visibility conditions. A continuous signal may be transmitted automatically in the diver's heart stops or exceeds preset limits. The diver's electrocardiogram signal is picked up by chest electrodes, amplified, filtered, and waveshaped into a trigger pulse which activates a one watt 40 kHz. sonar transmitter. (Modified author abstract)

AD-776 788/2GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge
A SIMPLE MULTI-CHANNEL SPIKE HEIGHT DISCRIMINATOR,
John A. Freeman. 1971, 13p AMRL-TR-70-126

Descriptors: *Electrophysiology, *Waveforms, *Discriminators, Spikes, Nerves, Response(Biology), Frequency, Bioinstrumentation.

In many types of electrophysiological experiments the activities of two or more neurons are recorded with a single microelectrode, and it is often desired to be able to study quantitatively the responses of each neuron individually. Several criteria can be used to distinguish between different units, e.g., spike height, rise time, duration, or wave shape. The difference in spike height is the most readily apparent characteristic by which two different neurons having roughly similar temporal firing patterns can be distinguished, and is the easiest to measure electronically. It is the purpose of the paper to present a simple, reliable and inexpensive spike height discriminator which uses off-the-shelf digital integrated circuitry, can be easily assembled, and can be extended to include as many separate spike channels as desired.

AD-776 789/0GA PC$4.00/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
AN ELECTRONIC STIMULUS ARTIFACT SUPPRESSOR,
John A. Freeman. 1971, 12p Rept no. AMRL-TR-70-133

Descriptors: *Electrophysiology, Recording systems, Electrodes.
Identifiers: *Electronic stimulus artifact suppressors.

A new method for abolishing unwanted stimulus artifacts is presented. A simple, inexpensive electronic stimulus artifact suppressor is described which can be used to reduce unwanted stimulus artifacts to any desired amplitude regardless of their magnitude, or of the number or configuration of stimulating or recording electrodes.

LA-UR-73-1688 PC$3.50/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
ELECTRONIC ANIMAL IDENTIFICATION AND TEMPERATURE MONITORING.
H. A. Baldwin, S. W. Depp, A. R. Koelle, and R. W. Freyman. 26p CONF-731053-1
Contract W-7405-eng-36

Descriptors: (*Animals, *Monitoring), (*Body temperature, Monitoring), Computer codes, Electronic equipment, Temperature monitoring.

For abstract, see NSA 29 07, number 17984.

PAT-APPL-381 234 PC$4.00/MF$1.45
Department of Health, Education, and Welfare, Washington, D.C.
THUMBTACK MICROELECTRODE AND METHOD OF MAKING SAME.
Patent Application,
Filed 20 Jul 73, 14p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electrodes, *Bioinstrumentation, *Patent applications, *Electrophysiologic recording, Nerve cells, Biotelemetry, Cerebral cortex.

The patent application relates to measuring intracortical brain waves and, more particularly, to microelectrodes for making chronic recordings of electrical discharges from single cells in the cerebral cortex of an animal's brain.

UCRL-75232 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HIGH-SPEED CELL ANALYSIS AND SORTING WITH FLOW SYSTEMS: BIOLOGICAL APPLICATIONS AND NEW APPROACHES.
M. A. Van Dilla, L. L. Steinmetz, D. T. Davis, R. N. Calvert, and J. W. Gray. 29 Nov 73, 16p CONF-731112-20

Descriptors: (*Cell cycle, *Mathematical models), Animal cells, Cell cultures, Dna, Electronic equipment, Growth.

For abstract, see NSA 29 07, number 17995.

6C. Biology

AD-776 482/2GA Reprint
Duke Univ Beaufort N C Marine Lab
THE INTERMOLT CYCLE OF CIRRIPEDS: CRITERIA FOR ITS STAGES AND ITS DURATION IN 'BALANUS AMPHITRITE',
C. William Davis, Unni E. H. Fyhn, and H. J. Fyhn. 1973, 15p
Contract N00014-67-A-0251-0061
Availability: Pub. in the Biological Bulletin, v145 n2 p310-322 Oct 73.

Descriptors: *Crustacea, *Barnacles, Life cycles, Physiology, Aquatic animals.
Identifiers: Balanus amphitrite, *Molting, Cirripedia.

Many physiological and behavior responses in crustaceans change markedly during the course of an intermolt cycle. To take such variations into account it is necessary to identify the stages of the intermolt cycle. Intermolt stages in cirripeds have been morphologically identified in only a few studies. The present study had two major objectives: to develop an intermolt staging method for barnacles which can utilize live, intact specimens taken at random, and to statistically analyze the intermolt cycle of adult specimens of B. amphitrite. (Modified author abstract)

AD-776 626/4GA Reprint
Armed Forces Inst of Pathology Washington D C
TOXOPLASMOSIS IN FREE-RANGING CHACMA BABOONS (PAPIO URSINUS) FROM THE KRUGER NATIONAL PARK,
E. E. McConnell, P. A. Basson, B. Wolstenholme, V. De Vos, and H. H. Malherbe. 1973, 5p
Availability: Pub. in Transactions of the Royal Society of Tropical Medicine and Hygiene, v67 n6 p851-855 1973.

Descriptors: *Toxoplasma, *Parasitic diseases, *Baboons, Monkeys, Primates, Protozoa, Pathology, Serology.
Identifiers: Papio ursinus, Toxoplasmosis, *Animal diseases.

Serological evidence of toxoplasmosis was found in 11 of 94 (11.7%) free-ranging chacma baboons from the Kruger National Park. Four of these

animals also showed typical cysts in the heart, brain, and skeletal muscles, without any accompanying inflammatory response.

AD-776 636/3GA Reprint
Armed Forces Inst of Pathology Washington D C
CASE FOR DIAGNOSIS,
G. Migaki, and F. R. Robinson. 1974, 3p
Availability: Pub. in Military Medicine, v139 n3 p209-211 Mar 74.

Descriptors: *Fungus diseases, *Dolphins(Mammals), *Skin diseases, Histology, Pathology, Diagnosis(Medicine), Aquatic animals.
Identifiers: Loboa loboi, Animal diseases.

A case of Lobo's disease involving the skin of a dolphin is described. Lobo's disease, known also as keloidal blastomycosis, is a chronic granulomatous cutaneous process caused by the fungus Loboa loboi. The true morphologic characteristics of Loboa loboi in tissue sections cannot be determined on hematoxylin and eosin sections but, when prepared with the Gridley fungus or the Gomori methenamine-silver stain, this fungus is seen as round to lemon-shaped cells of a rather uniform size, measuring from five to 10 microns in diameter. There are now 70 reported human cases of Lobo's disease, all occurring in persons in Central or South America. No human case has been reported in North America. In addition to this case in the dolphin, several other dolphins affected with Lobo's disease have been seen on the east coast of Florida. At the present time, there is reliable information as to how the disease is transmitted between man and the dolphin, if it actually is.

AD-777 057/1GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
FEMALE 'CULICOIDES' OF OKINAWA WITH DESCRIPTIONS OF NEW SPECIES (DIPTERA: CERATOPOGONIDAE).
Technical rept.,
John L. McDonald, T. Bolinguit, and L. C. Lu.
1973, 20p Rept no. NAMRU-2-TR-583
Availability: Pub. in Jnl. of Medical Entomology, v10 n6 p633-648, 30 Dec 73.

Descriptors: *Culicoides, *Ryukyu Islands, Diptera, Entomology, Females, Morphology(Biology), Classifications, Pacific Ocean Islands, Taxonomy.
Identifiers: *Okinawa, Taxonomic keys, Light traps, *Ceratopogonidae.

This is a revised listing of the culicoides of Okinawa which presents the descriptions of 23 species including 3 new species, 7 new records for Okinawa and a key. Almost all specimens were collected in alcohol light traps. Light traps were operated at various sites on the island at altitudes ranging from sea level to 250 m. In total, 77,162 specimens were taken during this study; 54,873 were identified to species, and from this latter group 500 were mounted on slides for more detailed examination. (Author)

COM-74-10578/4GA Reprint
Washington Univ., Seattle. Dept. of Oceanography.
SURF-ZONE DIATOMS OF THE COASTS OF WASHINGTON AND NEW ZEALAND ('CHAETOCEROS ARMATUM' T. WEST AND 'ASTERIONELLA' SPP.),
Joyce Lewin, and Richard E. Norris. 17 Apr 70, 9p
WSG-TA-70-3, Contrib-525 NOAA-74021503
Grant NSF-GB-7373, NSF-GB-4183
Pub. in Phycologia, v9 n2 p143-149 1970.

Descriptors: *Diatoms, Biomass, Algae, Washington(State), New Zealand, Cell morphology, Surf, Photographs, Shores.
Identifiers: *Algae blooms, Sea Grant program, Asterionella socialis, Asterionella glacialis, Chaetoceros armatum.

Surf-zone diatom populations occurring along the west coast of the Olympic Peninsula, state of Washington, are quite comparable to similar surf-zone populations along the west coast of North Island, New Zealand. In both locations, Chaetoceros armatum T. West contributes the predominant biomass. Asterionella glacialis Castracane (formerly called A. japonica Cleve ex Gran) frequently occurs with Ch. armatum in the surf zone along the New Zealand coast. Along the Washington coast, Asterionella socialis, a species newly described in the paper, accompanies Ch. armatum in the surf zone. Photographs of these species are included along with details of cell morphology. (Author)

COM-74-10587/5GA PC$4.25/MF$1.45
Maine Univ., Walpole. Marine Lab.
MARINE RESEARCH AND DEVELOPMENT PROJECTS BEING CONDUCTED AT THE UNIVERSITY OF MAINE,
Paul D. Ring. Feb 73, 25p Maine-Sea Grant-Leaflet-1 NOAA-74021103
Pub. also as Maine Univ., Walpole. Ira C. Darling Center. Darling-Ref-73-12.

Descriptors: *Marine resources, *Ocean environments, Aquaculture, Aquatic plants, Aquatic animals, Mineral deposits, Coastal engineering, Maritime law, Marine economics, Pollution, Hydrology, Social welfare, Hydrography, Political science, Research, Maine.
Identifiers: Sea Grant program.

Maine research and development projects underway at the University of Maine Marine Laboratory are identified and brief summaries on objectives are included. Some of the subjects encompassed are: Aquaculture, living resources other than aquaculture, mineral resources, marine law and economics, socio-political studies, coastal engineering, feasibility of dynamic river restoration, resource recovery and utilization, environmental research, pollution, and hydrography.

COM-74-10590/9GA PC$3.25/MF$1.45
Oregon Fish Commission, Port Orford. Div. of Management and Research.
NETARTS BAY ESTUARY RESOURCE USE STUDY - 1971,
Tom Gaumer, Darrell Demory, and Laimons Osis.
Jan 74, 29p NOAA-74021508
Contract DACW57-72-C-0138, Grant NOAA-N208-0073-72(N)

Descriptors: *Fishes, *Netarts Bay Estuary, *Invertebrates, Recreation, Seafood, Shellfish, Fishing, Clams, Crabs, Marine resources, Oregon, Commercial fisheries.

In 1971 the Fish Commission of Oregon studied the recreational use of marine food fish, shellfish, and miscellaneous invertebrates in Netarts Bay, OR. From March 1 through October 31, 1971, boat and shore anglers, tideflat users, and scuba divers were interviewed for catch, effort, and angler origin data. A total of 30,800 resource user trips (10,700 boat, 5,500 shore, and 14,600 tideflat) were expended on Netarts Bay during the study. This came to 64,000 hours of effort (35,300 boat, 9,500 shore, and 19,300 tideflat). Anglers of the three fisheries harvested 292,600 animals (232,900 clams, 28,000 miscellaneous invertebrates, 23,800 crabs, and 7,900 fish). (Modified author abstract)

COM-74-10592/5GA PC$3.25/MF$1.45
Oregon Fish Commission, Port Orford. Div. of Management and Research.
SIUSLAW RIVER ESTUARY RESOURCE USE STUDY - 1971,
Tom Gaumer, Darrell Demory, and Laimons Osis.
Jan 74, 29p NOAA-74021509
Contract DACW57-72-C-0138, Grant NOAA-043-208-55

Descriptors: *Fishes, *Siuslaw River Estuary, *Invertebrates, Recreation, Shellfish, Marine resources, Crabs, Clams, Seafood, Oregon, Commercial fisheries.

In 1971 the Fish Commission of Oregon studied the recreational use of marine food fish, shellfish, and miscellaneous invertebrates in the Siuslaw River Estuary, Oregon. Marine resources maps were prepared using information from this and previous Fish Commission studies. From March 1 through October 31, 1971, boat and shore anglers, tideflat users, and scuba divers were interviewed for catch, effort, and angler origin data. A total of 32,600 resource user trips (4,200 boat, 22,500 shore, and 5,900 tideflat) were expended on the Siuslaw River Estuary during the study. This came to 83,400 hours of effort (13,600 boat, 61,600 shore, and 8,700 tideflat). Anglers of the three fisheries harvested 184,400 animals (143,100 clams, 33,600 fish, 7,000 crabs, and 700 miscellaneous invertebrates). (Modified author abstract)

COM-74-10593/3GA PC$5.75/MF$1.45
Colorado State Univ., Fort Collins.
OPTIMUM ARTIFICIAL DIET TRAINING FOR SMALLMOUTH BASS.
Master's thesis,
Steven J. Puttmann. Sep 73, 55p NOAA-74021321

Descriptors: *Bass, Diets, Feeding habits, Animal nutrition, Feeding stuffs, Cost analysis, Acceptability, Theses, Oregon.
Identifiers: *Micropterus dolomieui, *Artificial diets.

Smallmouth bass advanced fry were trained to accept Oregon Moist Pellet semidry diet. Success in training ranged from 4.0 to 23.6%. Cost per trained smallmouth bass fingerling, based on labor and food only, ranged from $0.164 to $0.970. Training success data from previous research with larger bass, and this research were combined to project training success data to a commercial scale program for training smallmouth bass to accept artificial diets. Using a projection of 200,000 smallmouth bass, and considering all major production costs, cost per trained smallmouth bass ranged from $0.0068 to $0.0407 for varying sized fish. (Author)

COM-74-10594/1GA PC$7.75/MF$1.45
South Carolina Wildlife and Marine Resources Dept., Columbia. Div. of Game and Freshwater Fisheries.
COMMERCIAL ANADROMOUS FISHERY, EDISTO RIVER, SOUTH CAROLINA.
Completion rept., 1 Jun 70-31 May 73,
C. William Wade. 31 May 73, 95p NOAA-74021319

Descriptors: *Fisheries, *Edisto River, Commercial fishing, Statistical data, Age, Survival, Animal migrations, Growth, Management, Reproduction(Biology), Fish economics, South Carolina.
Identifiers: Anadromous fishes.

Six studies on the commercial anadromous fishery on the Edisto River, South Carolina are compiled in this report. These deal with statistical data, age and survival of brood fishes, population parameters and escapement rates, spawning activity, juvenile fishes, and evaluation of management techniques.

COM-74-10595/8GA PC$4.75/MF$1.45
Oregon State Univ., Corvallis. Dept. of Fisheries and Wildlife.
EFFECTS OF LOGGING ON SALMON POPULATIONS IN COASTAL STREAMS.
Completion rept. Jul 70-Jun 73,
Robert B. Lindsay. Nov 73, 32p NOAA-72041318

Descriptors: *Salmon, *Animal ecology, Animal migrations, Survival, Growth, Streams, Lumbering, Reproduction(Biology), Animal behavior, Coasts, Theses.
Identifiers: *Oncorhynchus kisutch, Anadromous fishes.

Two studies on coho salmon populations were completed in the period July 1970 to June 1973. The first was a doctor's thesis on popuics of the coho in three headwater tributaries. The second was a study of the survival and growth of these early emigrating fry. Among the results of the study was the conclusion that the findings provide a strong basis for stringent protective measures to be applied during logging operations on the very smallest spawning tributaries in order to protect this important habitat from damage.

COM-74-10596/6GA PC$4.00/MF$1.45
Virgin Islands Dept. of Conservation and Cultural Affairs, Charlotte Amalie, St. Thomas.
SELECTIVE LIFE HISTORY STUDY OF SILK AND BLACKFIN SNAPPER FROM THE VIRGIN ISLANDS.
Completion rept. Jul 72-Sep 73,
J. R. Sylvester, David Drew, and Arthur Dammann. Dec 73, 15p NOAA-74021320
Grant NMFS-2-192-R

Descriptors: *Marine fishes, *Virgin Islands, Life cycles, Abundance, Fecundity, Management, Sex, Mortality, Growth, Feeding habits.
Identifiers: *Lutjanus vivanus, *Lutjanus buccanella.

Silk, Lutjanus vivanus (Cuvier) and blackfin, Lutjanus buccanella (Cuvier), snappers have been shown to be the most abundant snappers taken in deep water in the Virgin Islands. Biological information is needed on these species to determine maximum and sustained yields so that successful management may be effective. The purpose of this project has been to study fecundity, growth, sex ratio, mortality, and food habits of silk and blackfin snapper.

COM-74-10601/4GA PC$3.25/MF$1.45
Alaska Univ., College. Inst. of Marine Science.
ABUNDANCE ESTIMATIONS AND GROWTH-RATE COMPARISONS FOR THE CLAM 'PROTOTHACA STAMINEA' FROM THREE BEACHES IN PRINCE WILLIAM SOUND, ALASKA, WITH ADDITIONAL COMMENTS ON SIZE-WEIGHT RELATIONSHIPS, HARVESTING AND MARKETING.
Technical rept.,
Howard M. Feder, and A. J. Paul. 1973, 43p IMS-R73-3, Sea Grant-73-2 NOAA-74021908
Grant NOAA-043-158-41, NSF-GD-31610

Descriptors: *Clams, *Prince William Sound, Population(Statistics), Abundance, Mollusca, Pelecypoda, Growth, Beaches, Galena Bay, Alaska, Toxicity.
Identifiers: Sea Grant program, *Prototheca staminea.

Population estimations of the littleneck clam, Prototheca staminea, were made for two beaches and one mud flat in Galena Bay, Prince William Sound, AK with calculated densities of 83,400, 147,900 and 1,159,500 clams, respectively. Average densities ranged from 17 to 23 clams per 0.25 sq. m. (68 to 92 per sq. m). It appears that 8 to 10 years of growth are required for P. staminea to reach a harvestable size, 30 mm in length, throughout Prince William Sound. (Modified author abstract)

COM-74-10605/5GA PC$3.00/MF$1.45
Mississippi State Univ., State College. Dept. of Agricultural and Biological Engineering.
MISSISSIPPI OYSTER CULTURE RESEARCH.
Progress rept.,
William H. Brown, C. David Veal, and William J. Demoran. 16 Feb 72, 11p MSGP-72-001 NOAA-74021909
Presented at Southeast Region Meeting of the American Society of Agricultural Engineers, Richmond, Va. 13-16 Feb 72. Prepared in cooperation with Gulf Coast Research Lab., Ocean Springs, Miss.

Descriptors: *Oysters, *Aquaculture, Biloxi Bay, Reproduction(Biology), Tides, Growth, Shellfish, Mississippi.
Identifiers: Sea Grant program, *Crassostrea virginica.

Several recent studies have shown that off-bottom oyster production, utilizing the entire water column is feasible. The site of cultch tests was an area of Biloxi Bay. CTV frames were submerged about 150 ft. apart on August 6, 1971. They were located in water varying from 6 1/2 ft to 8 ft in depth. Tidal flow at the site was moderate to strong. The test materials were inserted in CTV frames. Late summer spawning activity failed to produce a sufficient spat set for evaluation of the various materials. Observations of the CTV's at approximately one-month intervals failed to disclose any significant spat set on the cultch test specimens.

COM-74-10692/3GA PC$6.00/MF$1.45
Texas A and M Univ., College Station. Dept. of Marine Resources Information.
SYLLABUS OF FISH HEALTH MANAGEMENT: I. FISH CULTURE METHODS. II. FISH DISEASE DIAGNOSIS,
George W. Klontz. Dec 73, 235p* TAMU-SG-74-401 NOAA-74030411
Prepared in cooperation with Idaho Univ., Moscow.

Descriptors: *Aquaculture, *Animal diseases, *Fishes, Bacteria, Viruses, Nutrition, Epidemiology, Parasitic diseases, Fungus diseases, Mycobacterium, Animal ecology, Diagnosis, Toxicity, Hematology.
Identifiers: Sea Grant program, Neoplastic diseases, Idiopathic diseases.

The syllabus of fish health management consists of two sections. The first which deals with fish culture methods, gives information on: fish culture (husbandry) in the U.S.; types of fish husbandry; the basic constituents of a fish rearing facility; and fish nutrition. The second provides information on fish disease diagnosis. Subjects encompassed are: Principles of epidemiology of fish diseases; diagnostic methodology; and treatment and control of fish diseases. The types of diseases are bacterial, virus, mycotic, parasitic, environmental, nutritional, neoplastic, and idiopathic. The taxonomy of fish parasites is set forth in the report.

COM-74-10694/9GA PC$4.00/MF$1.45
Florida Dept. of Natural Resources, Tallahassee.
REESTABLISHMENT OF DESTROYED OYSTER REEFS.
Completion rept. Feb 72-Jun 73,
Edward G. Little, Jr. Aug 73, 5p NOAA-74022629
Grant NMFS-2-167-D(4b)

Descriptors: *Oysters, *Reefs, *Escambia Bay, Aquaculture, Fungus diseases, Parasites, Mollusca, Pelecypoda, Rehabilitation, Shellfish, Damage, Florida.
Identifiers: *Labyrinthomyxa marina, *Dermocystidium marinum.

Samples of oysters taken in the first few days of the open oyster season after September 1, 1971, indicated that between 70 and 99% of all oysters along the east bank of Escambia Bay perished from the oyster parasitic fungus disease Labyrinthomyxa marina. The areas destroyed by the kill in 1971 constituted more than 60% of the total natural approved acreage used prior to the 1971-72 oyster season. The Department of Natural Resources has successfully carried on and supervised oyster reef planting and rehabilitation projects for many years. Constructed reefs are planted in the form of a natural reef. Planted reefs are constructed in mounds with the tops just emergent at very low tides.

COM-74-10697/2GA PC$6.75/MF$1.45
Hawaii Univ., Honolulu. Sea Grant Program.
SEA GRANT PROGRAM. A REPORT FOR YEAR 04 1971-72.
Miscellaneous rept. 1 Sep 71-31 Aug 72,
Jack R. Davidson. Jan 74, 72p UNIHI-SEAGRANT-MR-74-02 NOAA-74031105
Contract NOAA-2-35243

Descriptors: *Fisheries, *Coastal zone management, Aquaculture, Marine resources, Dredging, Education, Ocean environments, Ocean bottom, Bibliographies, Offshore structures, Allocations.
Identifiers: Sea Grant program, Floating cities.

In the annual report information is given on research carried on during the period 1971-1972. Research projects described were in the areas of aquaculture, fisheries, coastal environment management, life in the sea, ocean bottom resources, effect of dredging, and research on the concept of the floating city to solve urban problems. Advisory and educational services are also summarized. Fund allocations by subject category are tabulated.

COM-74-10698/0GA Reprint
Virginia Inst. of Marine Science, Wachapreague, Va. Eastern Shore Lab.
GROWTH AND SURVIVAL OF THE BAY SCALLOP, 'ARGOPECTEN IRRADIANS', AT VARIOUS LOCATIONS IN THE WATER COLUMN AND AT VARIOUS DENSITIES,
William P. Duggan. 1973, 6p VIMS-Contrib-576 NOAA-74030405
Grant NOAA-NG-572
Pub. in Proceedings of the National Shellfisheries Association, v63 p68-71 Jun 73.

Descriptors: *Mollusca, *Growth, Survival, Ocean bottom, Depth, Mortality, Aquaculture, Shellfish, Density(Mass/Volume).
Identifiers: *Argopecten irradians, Sea Grant program.

Two experiments were carried out in 1971 using bay scallops spawned in August and September of 1970. Four groups of 150 scallops were held at the surface, one meter below the surface, two meters off the bottom, and one meter off the bottom to find the effects of depth on growth and survival. Scallops were held in surface enclosures at four different densities (100, 75, 50 and 24 sq ft) to find out the effects of crowding. In the depth experiment growth was approximately equal throughout the water column. Mortality decreased with increasing depth with the exception of those held at one meter off the bottom. (Modified author abstract)

COM-74-10716/0GA PC$3.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
STUDY OF MEANS OF AUTOMATICALLY CLASSIFYING PLANKTON,
Louis L. Sutro. 31 Jan 74, 31p* MIT-SG-74-11 NOAA-74031111
Contract NOAA-NG-4372
Index No. 74-311-Vlk. Also pub. as Draper (Charles Stark) Lab., Inc., Cambridge, Mass., CDSL-R-740.

Descriptors: *Plankton, *Mechanical classifiers, *Zooplankton, Detectors, Cybernetics, Binocular vision, Models, Three dimensional display systems, Fisheries, Television cameras, Computers, Classifications.
Identifiers: Sea Grant program.

The authors have examined the way human sorters classify plankton to assist in developing a device that can perform in the same manner. Supporting this development are, a stereo-TV-camera-computer which can automatically form a three-dimensional model of a scene before it; designs being made of gimballed stereo TV cameras that can look around with both high-resolution central views and lower resolution peripheral views; observation that human being successively fixate, at the points where the binocular axes of the cameras

converge, features on the surfaces of objects, and process both the features and the scan path between them, to recognize objects; solid-state sensor arrays to transduce the image; and increasingly small, fast and inexpensive computer components.

COM-74-10727/7GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
DIVERSITY IN METABOLIC ADAPTATION OF PELAGIC LARVAL STAGES OF TWO SYMPATRIC SPECIES OF BRACHYURAN CRABS,
A. N. Sastry, and J. F. McCarthy. 1973, 15p
NOAA-74031108
Grant NSF-GA-35748
Presented at European Symposium on Marine Biology (7th).
Pub. in Netherlands Jnl. of Sea Research, v7 p434-446 1973.

Descriptors: *Crabs, *Aquaculture, Salinity, Metabolism, Temperature measurement, Larvae, Crustacea, Shellfish, Pelagic zone.
Identifiers: *Cancer irroratus, *Cancer borealis, Sea Grant program.

The larvae of Cancer irroratus and C. borealis were cultured in the laboratory and the effect of temperature and salinity on larval development was studied. The larvae of C. irroratus survived a wide range of temperatures and salinities up to the megalops stage. But metamorphosis occurred in salinities between 20 parts per thousand and 35 parts per thousand S at 15C, and 25 parts per thousand S at 20C. The larvae of C. borealis survived in a wide range of temperatures and a narrow range of salinities in the early zoeal stages, but the larvae developed to the megalops stage in only 30 parts per thousand S at 15C, and 25 parts per thousand and 30 parts per thousand S at 20C.

COM-74-10731/9GA PC$5.75/MF$1.45
Puerto Rico Dept. of Agriculture, San Juan.
STATUS OF FISHERIES IN PUERTO RICO, 1972. (LA PESCA EN PUERTO RICO, 1972),
Jose A. Suarez-Caabro. Apr 73, 51p NOAA-74022627
Text in English and Spanish. Pub. in Agricultural and Fisheries Contributions, v5 n3 p1-50 Apr 73.

Descriptors: *Fisheries, *Puerto Rico, *Commercial fishing, Fishes, Shellfish, Fish economics, Lobsters, Fishing equipment.

During 1972, a minimum total of 4,601,250 pounds of fish and shellfish were reported from Puerto Rico local fisheries; 85% was fish of various species, and 15%, shellfish. The average ex-vessel price per pound was 36 cents for fish and 84 cents for shellfish. At least 2,000 fishermen participated and 800 boats were used in the fishery. Of this quantity, 66% were fish and lobster pots and 34% other gear, mainly handlines and nets. The minimum total value of the fish and shellfish production in 1972 reached 1,930,000 dollars, based on the ex-vessel price. (Modified author abstract)

COM-74-10734/3GA PC$4.00/MF$1.45
Louisiana Wild Life and Fisheries Commission, New Orleans. Div. of Oysters, Water Bottoms and Seafoods.
THE MOLLUSK COMMUNITIES OF LAKES PONTCHARTRAIN AND MAUREPAS, LOUISIANA,
Ronald J. Dugas, Johnnie W. Tarver, and Linda S. Nutwell. Jan 74, 20p LWLFC-Technical Bull-10
NOAA-74022031
Grant NOAA-042-27-71, NMFS-2-91-R

Descriptors: *Mollusca, *Pontchartrain Lake, *Maurepas Lake, Distribution(Property), Brackish water, Animal ecology, Pelecypoda, Gastropoda, Louisiana.
Identifiers: Rangia cuneata, Mulinia pontchartrainensis, Vioscalba louisianae, Littoridina sphinctostoma, Polymesoda caroliniana, Crassostrea virginica, Tagelus plebeius.

Data analysis of molluscan distribution indicates several trends: R. cuneata and few M. Pontchartrainensis were the only species recorded from samples collected in Lake Maurepas. From the western edge of Lake Pontchartrain a variety of species was recorded (V. louisianae, L. sphinctostoma, R. cuneata, and P. caroliniana). Concentrations of C. virginica and T. plebeius were located in the eastern section of Lake Pontchartrain where the greatest fluctuations and highest salinities were recorded.

COM-74-50189-02/GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES REVIEW. VOLUME 36, NUMBER 2, FEBRUARY 1974.
Monthly rept.,
Thomas A. Manar. Feb 74, 58p NOAA-74030603
Paper copy available from GPO $12.50/year as C55.310:36, $1.25/copy as C55.310:36/2.

Descriptors: *Marine fishes, Aquatic biology, Insects, Fishes, Crustacea, Mollusca, Fatty acids, Seafood, Food, Salmon, Fishing equipment, Columbia River Estuary, Fish protein concentrates, Food storage, Fishing products, Mushrooms.
Identifiers: Sport fishing.

The issue contains the following articles: Notes on the ecology of the oceanic insect Halobates; chemical and nutritive values of several fresh and canned finfish, crustaceans, and mollusks. Part II. Fatty acid composition; using enzymes to make fish protein concentrates; the Mexican marine sport fisheries; variable-mesh beach seine for sampling juvenile salmon in Columbia River Estuary; mushroom culture--A new potential for fishery products; and effect of draining method on the quality of fish stored in boxes.

COM-74-50189-02-04/GA
(Order as COM-74-50189-02)
Instituto Nacional de Pesca, Mexico City.
THE MEXICAN MARINE SPORT FISHERIES,
Aurelio Solorzano. 1974, 5p NOAA-74030603-4, MFR-Paper-1035
Included in Marine Fisheries Review, v36 n2 p19-22 Feb 74, COM-74-50189-02.

Descriptors: *Fisheries, *Mexico, Recreation, Identifying.
Identifiers: *Sport fishing.

A preliminary survey of the sport fisheries of Mexico is presented. Information is given on government agencies involved with sport fisheries and the various sport fishes. Two types of sport fisheries are identified as the commercial sport fishery using charter or party boats and fishing from private boats and from shore.

COM-74-50189-02-05/GA
(Order as COM-74-50189-02)
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
VARIABLE-MESH BEACH SEINE FOR SAMPLING JUVENILE SALMON IN COLUMBIA RIVER ESTUARY,
Carl W. Sims, and Richard H. Johnsen. 1974, 5p
NOAA-74030603-5, MFR-Paper-1036
Included in Marine Fisheries Review, v36 n2 p23-26 Feb 74, COM-74-50189-02.

Descriptors: *Salmon, *Fishing equipment, Nets, Estuaries, Columbia River.
Identifiers: Oncorhynchus.

A 332-foot variable-mesh beach seine has been developed to sample juvenile salmon, Oncorhynchus spp., in the Columbia River estuary. This net is designed for a two- or three-man operation and can be set with a small boat (19-20 feet) powered by an outboard engine (40 hp minimum). The net is particularly effective at capturing juvenile fall chinook salmon, O. tshawytscha, coho salmon, O. kisutch, chum salmon, O. keta, and cutthroat trout, Salmo clarki; it can also be used to sample various other species in the estuarine environment. (Author)

COM-74-50189-02-06/GA
(Order as COM-74-50189-02)
National Marine Fisheries Service, College Park, Md. College Park Fishery Products Technology Lab.
MUSHROOM CULTURE: A NEW POTENTIAL FOR FISHERY PRODUCTS,
John H. Green. 1974, 7p NOAA-74030603-6, MFR-Paper-1037
Included in Marine Fisheries Review, v36 n2 p27-32 Feb 74, COM-74-50189-02.

Descriptors: *Mushrooms, *Fishing products, Composts, Nitrogen organic compounds, Cultivation, Oils, Marine fishes, Growth.
Identifiers: *Mushroom culture.

Fish solubles were successfully substituted for other organic nitrogen supplements commonly used in mushroom composting and subsequent mushroom culture. These experiments performed in 1971-1972, indicated that in certain situations larger mushrooms were produced when combinations of fish solubles and other organic nitrogen supplements were used. Currently under investigation in 1973-1974 is the use of fish oils, substituted for polyunsaturated vegetable oils, to stimulate increased yields of mushrooms. A brief description of mushroom cultivation is given with emphasis on nitrogen supplementation of composts and polyunsaturated oil stimulation for increased mushroom yields. (Modified author abstract)

COM-74-50275/8GA PC-GPO/MF$1.45-NTIS
national Marine Fisheries Service, Seattle, Wash.
SEASONAL OCCURRENCE OF YOUNG GULF MENHADEN AND OTHER FISHES IN A NORTHWESTERN FLORIDA ESTUARY.
Technical rept.,
Marlin E. Tagatz, and E. Peter H. Wilkens. Aug 73, 19p NOAA-TR-NMFS-SSRF-672 NOAA-73101012
Paper copy available from GPO as C55.13:NMFS SSRF-672.

Descriptors: *Marine fishes, *Estuaries, Seasonal variations, Abundance, Distribution(Property), Growth, Larvae, Salinity, Temperature measurement, Pensacola Bay, East Bay River, East Bay.
Identifiers: *Brevoortia patronus.

Gulf menhaden, Brevoortia patronus, and other species of fishes were collected by plankton net, seine, and surface trawl from Pensacola Bay, East Bay, and East Bay River from December 1969 to October 1971. Relative abundance, distribution, and relative growth of menhaden are given from the time they enter the estuary as larvae in December to the time they emigrate to the Gulf of Mexico as juveniles in September. Eighty-four species of fishes, representing 46 families, were captured. The number and length range of each species by month are presented for the areas from which it was caught. Also included are the salinity and temperature ranges at capture. Four species were not previously recorded from Pensacola estuaries. (Author)

COM-74-50277-01/GA MF$1.45
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES ABSTRACTS. VOLUME 27, NUMBER 1, JANUARY 1974.
Monthly pub.
Jan 74, 51p NOAA-CFABA-27(1) NOAA-74031102
Paper copy available from National Oceanic and Atmospheric Administration, 3300 Whitehaven St., N.W. Washington, D.C. 20235. Free.

Descriptors: *Fisheries research, Abstracts, Aquaculture, Food processing, Fishing, Crabs, Shellfish, Ecology, Oceanographic data, Pollution, Marine biology, Bibliographies, Seafood, Periodicals.

Marine Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

COM-74-50277-02/GA MF$1.45
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES ABSTRACTS. VOLUME 27, NUMBER 2, FEBRUARY 1974.
Monthly pub.,
Feb 74, 31p NOAA-CFABA-27(2) NOAA-74031103
Paper copy available from National Oceanic and Atmospheric Administration, 3300 Whitehaven St., N.W. Washington, D.C. 20235. Free.

Descriptors: *Fisheries research, Abstracts, Periodicals, Commercial fishing, Aquaculture, Food industry, Fishing industry, Aquatic biology, Marine biology, Oceanographic data, Ecology, Pollution, Bibliographies.

Marine Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

COM-74-50277-03/GA MF$1.45
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES ABSTRACTS. VOLUME 27, NUMBER 3, MARCH 1974.
Monthly pub.
Mar 74, 35p NOAA-CFABA-27(3) NOAA-74031104
Paper copy available from National Oceanic and Atmospheric Administration, 3300 Whitehaven St., N.W. Washington, D.C. 20235. Free.

Descriptors: *Fisheries research, Abstracts, Reefs, Aquaculture, Salmon, Fishing industry, Whales, Food processing, Shellfish, Seafood, Commercial fishing, Oceanographic data, Pollution, Bibliographies, Periodicals.

Marine Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

COO-3278-16 PC$6.25/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa). Mc Collum-Pratt Inst.
GROWTH AND DISSIPATION OF PHYTOPLANKTON IN CHESAPEAKE BAY. II. A STATISTICAL ANALYSIS OF PHYTOPLANKTON STANDING CROPS IN THE RHODE AND WEST RIVERS AND AN ADJACENT SECTION OF THE CHESAPEAKE BAY.
H. H. Seliger, and M. E. Loftus. 1973, 82p
Contract AT(11-1)-3278

Descriptors: (*Plankton, *Growth), (*Chesapeake bay, Plankton), Distribution, Plants, Rivers, Statistics.

For abstract, see NSA 29 07, number 17981.

N74-16827/9GA PC$4.25/MF$1.45
Defence Research Information Centre, Orpington (England).
PHOTORESPIRATION AND THE PRIMARY REACTIONS OF PHOTOSYNTHESIS.
B. Loetsch. Sep 73, 21p DRIC-TRANS-3293, BR30618
Tran-Transl. Into English from Ber. Deut. Bot. Ges. (Stuttgart), V. 2, No. 83, 1970 p 41-54.

Descriptors: *Carbon dioxide, *Photosynthesis, *Plants (Botany), *Respiration, Adenosine triphosphate (Atp), Chlorophylls, Metabolism, Oxygen consumption, Phosphorylation, Photochemical reactions.

For abstract, see STAR 1208

PATENT-3 238 098 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF CONTROLLING SEA LAMPREY.
Patent,
John H. Howell, and Everett L. King, Jr. Filed 27 Jan 64, patented 1 Mar 66, 3p PAT-APPL-340 573, DOCKET/FWS-684
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Lampreys, *Pesticides, *Patents, Great Lakes, Pest control, Larvae, Trout, Mortality, Toxicity, Nitro compounds, Salicycylamides, Effectiveness.
Identifiers: PAT-CL-167-46, *Petromyzon marinus.

The invention relates to control of the sea lamprey (Petromyzon marinus), and more particularly, to chemical treatment of aquatic habitats in which the larval stage of the lamprey lives and grows. It is an object of the invention to provide a larvicide which will effect a substantially complete eradication of larval lampreys in a water course without causing significant harm or mortality of game and food fish. It has now been found that halo-nitrosalicylanilides, possess outstanding lamprecidal activity, both as to toxicity and selectivity.

PB-229 869/3GA PC$8.25/MF$1.45
National Environmental Research Center, Research Triangle Park, N.C.
BIBLIOGRAPHY OF THE CAT.
Final rept.,
Ezra Berman. Feb 74, 380p* EPA-650/3-74-001

Descriptors: *Bibliographies, *Cats, Canivora, Mammals, Domestic animals, Indexes(Documentation), Reproduction(Biology), Growth, Animal husbandry, Animal diseases, Veterinary medicine, Physiology.

Report is a bibliography of the domestic cat and contains almost 1500 citations, a majority of which are annotated. The citations are indexed according to the content of the source.

RLO-2225-5-18 PC$10.60/MF$1.45
Washington Univ., Seattle (Usa). Dept. Of Genetics.
BIBLIOGRAPHY OF THEORETICAL POPULATION GENETICS.
J. Felsenstein, and B. Taylor. 454p
Contract AT(45-1)-2225

Descriptors: (*Genetics, *Bibliographies), Animals, Communities, Ecosystems, Genetic variability, Human populations, Man, Mutations, Plants, Population dynamics, Populations, Statistics.

For abstract, see NSA 29 07, number 17992.

RT/BIO-(73)7 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
GENETIC CONTROL OF THE ERYTHROID DIFFERENTIATION IN RAT EMBRYOS.
U. Andreozzi, and A. Fantoni. 1971, 40p
In Italian. U.S. Sales Only.

Descriptors: (*Embryos, Erythropoiesis), (*Erythropoiesis, *Genetics), Rats.

For abstract, see NSA 29 07, number 17993.

TT-72-54018 PC$4.75/MF$1.45
Smithsonian Institution, Washington, D.C.
ACTA ZOOLOGICA CRACOVIENSIA. VOLUME 15, NUMBERS 1, 4, 5, 6, 1970.
1973, 137p
The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Zoology, *Birds, Taxonomy, Ecology, Translations, Poland, Animal behavior, Photographs, Periodicals.
Identifiers: Ornithology, Turdus torquatus, Regulus ignicapillus, Ficedula parva, Prunella collaris, Anthus spinoletta.

The coverage refers to 108 bird species from Babia Gora Mountain. Seventy-six species belong to the breeding fauna, while 5 species are alleged to the nesters. Of greatest interest are the following species: Turdus torquatus, Regulus ignicapillus, Ficedula parva, Prunella collaris and Anthus spinoletta. Comparative studies of bird associations from different habitats have proved the species composition to be mainly affected by the biotic aspects of the habitat and by the details of biology of individual bird species. Factors of a similar type govern the altitudinal distribution. The article closes with a comparative estimate of Babia Gora birds and of bird species from other European mountains. (Author)

TT-74-50006 PC$10.25/MF$1.45
National Science Foundation, Washington, D.C.
ESSENTIALS OF NEMATODOLOGY. VOLUME VIII. OXYURATA OF ANIMALS AND MAN. (OKSYURATY ZHIVOTNYKH I CHELOVEKA). PART ONE. OXYUROIDEA,
K. I. Skryabin, N. P. Shikhobalova, and E. A. Lagodovskaya. 1974, 532p
Trans. of Akademiya Nauk SSSR. Gelmintologicheskaya Laboratoriya. Osnovy Nematodologii, v8 pt1 1960, by R. Lavoott. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *USSR, *Nematoda, Parasites, Morphology, Classifications, Distribution(Property), Taxonomy, Translations.
Identifiers: Oxyuroidea.

The present volume of the series 'Essentials of Nematodology' is a comprehensive study of the Oxyurata, one of the largest suborders of parasitic nematodes. This suborder is widely distributed and includes about 1,000 species. The suborder is divided into five superfamilies: Oxyuroidea, Cosmocercoidea, Heterakoidea, Subuluroidea, and Attractoidea. Only the Oxyuroidea are treated in this volume. The other superfamilies of the Oxyurata will be dealt with in four further volumes. The intention is to provide biologists, physicians, veterinarians, ichthyopathologists, and entomologists with a guide for determining the species of this suborder and also for using data to formulate biological and theoretical concepts in medical and veterinary practice.

TT-74-50006 PC$13.00/MF$1.45
National Science Foundation, Washington, D.C.
FLORA OF THE U.S.S.R. VOLUME XIV. GERANIALES, SAPINDALES, RHAMNALES,
B. K. Shishkin. 1974, 649p
Trans. of Akademiya Nauk SSSR. Botanicheskii Institut. Flora S.S.S.R., v14 1949, by U. Lavoott.

Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *USSR, *Plants(Botany), Taxonomy, Biology, Morphology, Translations.
Identifiers: Dicotyledons, Sapindales, Geraniales, Rhamnales.

The publication of Volume XIV concludes the descriptions of the choripetalous plants of the Russian flora. The description of 547 wild species of the USSR and 30 cultivated ones are presented. As in the previous volumes, critical treatment of the material for this publication has disclosed about ten percent of new species, as well as new concepts on the taxonomy of Linaceae, Zygophyllaceae, Euphorbiaceae, and Rhamnales. Aceraceae and Buxaceae and some other trees and shrubs described here by the prominent authority, A.I. Poyarkova, also include taxonomical innovations. The species of Celastraceae, Anacardiaceae, Aceraceae and Rhamnales described in this volume are currently of special interest as a potential source for expanding the assortment of strains suitable for shelter belts and, in general, for ornamental planting.

TT-74-50007 PC$13.00/MF$1.45
National Science Foundation, Washington, D.C.
FAUNA OF THE U.S.S.R. CRUSTACEA. VOLUME 1. NUMBER 2. CHYDORIDAE (FAUNA SSSR. RAKOOBRAZNE. VOLUME 1. NUMBER 2. CHYDORIDAE FAUNY MIRA).
N. N. Smirnov. 1974, 649p
Trans. of Fauna SSR. Novaya Seriya, n101 1971, by A. Mercado. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Crustacea, *USSR, Ecology, Taxonomy, Morphology, Distribution(Property), Fresh water biology, Translations.
Identifiers: *Chydoridae, Limnology, Cladocera.

The Chydoridae, the largest family of the order Cladocera, is clearly defined morphologically and ecologically. The species of this family are abundant in the littoral of freshwater bodies and are an important food object for many fishes. Some Chydoridae can be bred for food in fish breeding. The Chydoridae are also guide forms for the history of lakes, because their numerous remains are well preserved in sediments and can be determined to the species. The authors have revised the classification of the Chydoridae on the basis of fresh material an examination of the types and a study of the literature. Material was collected from the Volga from Kalinin to the delta, from the Cherepovets and Kama reservoirs, and from water bodies in the Moscow Region, Crimea, and Baikal.

6D. Bionics

N74-16845/1GA PC$11.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ROBOT ARM DYNAMICS AND CONTROL.
A. K. Bejczy. 15 Feb 74, 156p NASA-CR-136935, JPL-TM-33-669
Contract NAS7-100

Descriptors: *Manipulators, *Remote control, *Robots, Algorithms, Matrices (Mathematics), Servocontrol, Torque.

For abstract, see STAR 1208

UR-3490-354 PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa). School of Medicine and Dentistry.
BIOLOGICAL IMPLICATIONS OF THE ADOLESCENT GROWTH PROCESS: BODY COMPOSITION.
G. B. Forbes. 1973, 17p CONF-730675-1

Descriptors: (*Growth, *Mathematical models), Abundance, Calcium, Man, Nitrogen, Potassium 40, Whole-body counting.

For abstract, see NSA 29 07, number 17996.

6E. Clinical Medicine

AD-776 310/5GA PC$8.50/MF$1.45
Naval Postgraduate School Monterey Calif
MULTIDIMENSIONAL ANALYSIS OF THE ELECTROENCEPHALOGRAM USING DIGITAL SIGNAL PROCESSING TECHNIQUES.
Master's thesis,
Stephen Edward Dollar. Dec 73, 111p

Descriptors: *Electroencephalography, *Signal processing, Brain, Electrophysiology, Associative processing, Spectrum signatures, Computer programming, Theses.
Identifiers: Tegules, Computer aided analysis, Biofeedback.

The first series of results of a major research project for the analysis of the electroencephalogram (EEG) are reported. The requirements of a system capable of real time, multidimensional analysis of the EEG are described. The time and frequency domain computer analysis programs written for the project are discussed. A major result of the research indicates that a significant portion of the EEG is composed of a series of discrete frequency sinusoids. These signals have a spindle shape and their average durations are constant over the frequency range from 14 to 50 Hz, with the exception of sinusoids of 42 Hz. The signals are defined as tegules. The properties of a tegule are defined, as found from experimental results. The anomaly with respect to the 42 Hz tegule is related to the subjects's mental state and may be a source of feedback to indicate whether he is thinking or relaxing. (Author)

AD-776 312/1GA PC$7.00/MF$1.45
Naval Postgraduate School Monterey Calif
SELECTION OF POLICIES FOR MILITARY DEPENDENT PRIMARY MEDICAL CARE DELIVERY SYSTEMS.
Master's thesis,
Kent Sherwood Hull. Mar 74, 77p

Descriptors: *Medical services, *Military medicine, Patients, Theses, Economics, Public health, Civilian population.
Identifiers: *Health care delivery systems, Outpatient services.

Some contrasts between civilian and military facility sources of military dependent outpatient medical care sectors of the Uniformed Services Health Benefits Program system are examined. Decreasing the proportion of patient utilization of civilian sources is selected as a system improvement, and increasing military physician accession and retention is seen as a necessary adjunct. Preference as expressed in choice behavior is identified as the proximate mechanism in present utilization patterns and is suggested as a predictor for utilization patterns under alternative policies. A method for assessing preference predictions is proposed and selection of an optimal policy discussed. (Modified author abstract)

AD-776 492/1GA Reprint
Armed Forces Inst of Pathology Washington D C
VALIDATING ADVERSE DRUG REACTION CASES.
Nelson S. Irey. 1973, 4p
Availability: Pub. in Jnl. of Legal Medicine, Sep/Oct 73.

Descriptors: *Drugs, *Allergic diseases, Diagnosis(Medicine), Pathology, Signs + symptoms, Toxicology.
Identifiers: *Drug allergies.

Difficulties in evaluating drug-reaction cases have arisen from failure to study time relationships between drugs and disease makers, failure to rule out other-than-drug causes, failure to use clinical-laboratory data, and lack of communication between clinician and pathologist. The successive steps of evaluating temporal eligibility, considering the points of differential diagnosis, and using the various means of selecting and linking the drug to the reaction constitute a series of criteria to be met before the allegation of the drug relationship is valid.

AD-776 526/6GA Reprint
National Cancer Inst Bethesda Md Lab of Pathology
POSTNATAL CYTOMEGALOVIRUS HEPATITIS: AN AUTOPSY AND LIVER BIOPSY STUDY,
Donald E. Henson, Philip M. Grimley, and Alfonso J. Strano. 1974, 12p
Availability: Pub. in Human Pathology, v5 n1 p93-103 Jan 74.

Descriptors: *Hepatitis, *Virus diseases, Serology, Histology, Pathology, Viruses, Liver, Infectious diseases.
Identifiers: *Cytomegaloviruses, *Salivary gland viruses.

Cytomegalovirus hepatitis was studied in 13 patients; 11 had died during disseminated cytomegalovirus infection and two had liver biopsies for suspected hepatitis. Histologically, inclusions were present in liver cells of all three lobular zones and less frequently in the vascular endothelium of the portal areas. Infected liver cells were seen in the cords, partially extruded into sinusoids, or within sinusoids where they were surrounded by inflammatory cells that formed small focal lesions. In the two patients with liver biopsies, the serum glutamic oxaloacetic transaminase, serum glutamic pyruvic transaminase, and alkaline phosphatase activities were transiently increased. Serological studies in these two patients showed high titers of cytomegalovirus complement fixing antibody. The results indicate that cytomegalovirus hepatitis is characterized by a focal mononuclear cell infiltration in the lobules and a pleomorphic cell infiltration in the portal areas. The histological lesions of biopsy proved cytomegalovirus hepatitis resemble the changes seen in livers of patients dying with hepatic involvement during disseminated infection. (Modified author abstract)

AD-776 556/3GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
IMPROVEMENT OF SCIENCE MANAGEMENT,
S. Chikin, and B. Somov. 6 Nov 73, 4p Rept no. FSTC-HT-23-2598-72
Trans. of Meditsinskaya Gazeta (USSR) n72 p3, 21 Sep 71, by D. Trombley.

Descriptors: *Scientific research, *USSR, Computers, Public health, Medical research, Translations.

In the Russian Soviet Federated Socialist Republic scientific research in the areas of medicine and public health is carried out at 68 research institutes and 40 institutes of higher learning. More than 20,000 professional and teaching personnel, among which 1,500 are Doctors of Science and 9,000 Candidates of Science, are occupied with this scientific effort. The attention of medical scientists in the Russian Federation is directed to broadening of scientific research concerning hygiene problems, development of new methods of medical treatment of cardio-vascular pathology, malignant new growths, prophylaxis and medical treatment of the most prevalent diseases of children and other urgent problems.

AD-776 625/6GA Reprint
Armed Forces Inst of Pathology Washington D C

PATHOLOGY OF ADENOMAS OF THE PITUITARY GLAND,
Kenneth M. Earle, and Samuel H. Dillard, Jr.
1973, 16p Rept no. ISBN-90 219 0245 1
Availability: Pub. in Proceedings of Conference (Diagnosis and Treatment of Pituitary Tumors), Bethesda, Md. 15-17 Jan 73 (Excerpta Medica, Amsterdam), p3-16 1973.

Descriptors: *Pituitary gland, *Neoplasms, Electron microscopy, Histology, Pathology, Diagnosis(Medicine), Biopsy.
Identifiers: *Adenoma.

When the clinical history, X-ray and operative findings, and histologic pattern are compatible with an adenoma of the pituitary, the diagnosis can be confirmed with ordinary histologic techniques with a high degree of accuracy. The diagnosis may be difficult when the biopsy is: from the coverings of the tumor, complicated by hemorrhages or necrosis, altered by surgical compression, freezing or coagulation, small or from a tumor that has been irradiated frozen or previously biopsied. The anatomic pathology of chromophobe, eosinophilic and basophilic adenomas is reviewed. Growth is considered in relation of histologic features. Statistical studies of 454 symptomatic and 487 incidental adenomas of the pituitary are reported. The problems encountered in the differential diagnosis of an adenoma of the pituitary are reviewed.

AD-776 627/2GA Reprint
Armed Forces Inst of Pathology Washington D C
CONGENITAL CORNEAL LEUKOMAS. 1 CENTRAL DEFECT IN DESCEMET'S MEMBRANE,
William M. Townsend. 1974, 8p
Availability: Pub. in American Jnl. of Ophthalmology, v77 n1 p80-86 Jan 74.

Descriptors: *Cornea, *Neoplasms, *Ophthalmology, Eye, Pathology, Histology, Diagnosis(Medicine), Classification.
Identifiers: *Congenital abnormalities.

The classification and terminology of congenital corneal leukomas have been most confusing. Eponymic designations have been used with varying implications by different authors, and conversely, terms that should designate different entities have been used synonymously. It is the purpose of this paper, therefore, to review critically the most significant contributions on congenital opacities of the cornea in an effort to arrive at a simple, yet historically accurate summary of the subject.

AD-776 628/0GA Reprint
Armed Forces Inst of Pathology Washington D C
CUTANEOUS SEBACEOUS NEOPLASMS,
David B. Rulon, and Elson B. Helwig. 8 Jun 73, 21p
Availability: Pub. in Cancer, v33 n1 p82-102 Jan 74.

Descriptors: *Neoplasms, Cancer, Skin(Anatomy), Diagnosis(Medicine), Histology, Pathology.
Identifiers: Sebaceous gland.

Ninety-five patients, each having a single cutaneous sebaceous neoplasm, were selected for study. Lesions of the eyelids were excluded. The tumors were classified as sebaceous adenomas (46), basal cell carcinomas with sebaceous differentiation (43), and sebaceous carcinomas (6). Morphological criteria for separation into these categories are discussed and illustrated. Lesions considered transitional between the classes were observed. Recurrence was unusual, occurring in only three sebaceous adenomas, three basal cell carcinomas with sebaceous differentiation, and one sebaceous carcinoma. Only one tumor, a sebaceous carcinoma, showed aggressive local growth. None metastasized. This behavior contrasts with the frequently observed metastases and death associated with sebaceous carcinoma arising in eyelids, caruncle, or orbit. (Author)

AD-776 634/8GA Reprint
Armed Forces Inst of Pathology Washington D C
MIXED GLIOMAS,
Michael Noel Hart, Carol K. Petito, and Kenneth M. Earle. 11 Jun 73, 7p
Availability: Pub. in Cancer, v33 n1 p134-140 Jan 74.

Descriptors: *Neoplasms, *Brain, *Spinal cord, Central nervous system, Neurology, Histology, Pathology, Diagnosis(Medicine).
Identifiers: Gliomas.

One hundred and two cases of central nervous system glial neoplasms composed of varying mixtures of oligodendroglioma, astrocytoma, and ependymoma were reviewed. The tumors were divided into Grade I and II, and into 'compact' types where representative tumor types were located in separate areas, and 'diffuse' types where representative tumor cells were intermingled. Prognosis for Grade I was good, and commensurate with published survival statistics for Grade I astrocytoma and oligodendroglioma. Survival time for Grade II was close to published survival statistics for Grade II astrocytoma. Survival rates could not be related to other parameters. Sixteen cases progressed to glioblastoma multiforme. (Author)

AD-776 635/5GA Reprint
Armed Forces Inst of Pathology Washington D C
INTIMAL VASCULAR LESIONS ASSOCIATED WITH FEMALE REPRODUCTIVE STEROIDS,
Nelson S. Irey, and Henry J. Norris. 4 Jun 73, 8p
Availability: Pub. in Archives of Pathology, v96 p227-234 Oct 73.

Descriptors: *Steroids, *Thrombosis, Hormones, Blood circulation, Blood vessels, Reproductive system, Females, Laboratory animals, Experimental data.
Identifiers: Oral contraceptives.

Intimal proliferation, with and without associated thrombosis, has been found in women taking oral contraceptives, and in pregnant and postpartum women. Similar vascular changes have been demonstrated by others in pregnant and postpartum guinea pigs, and experimentally in animals receiving female reproductive steroids. This intimal lesion is not specific for or unique to steroid effect, since it is seen in many other conditions. However, the clinicopathologic profile in this series of oral contraceptive, pregnancy, and postpartum cases suggests that exogenous and endogenous female reproductive steroids may be the common hormonal factor producing intrinsic vascular lesions with resultant circulatory compromise, and that these steroids should be included in the list of agents and conditions with which intimal proliferation may be associated. (Author)

AD-776 638/9GA Reprint
Naval Medical Research Inst Bethesda Md
PATHOLOGIC RESPONSE OF GINGIVA TO AN AMINO ACID INCREASE.
Medical research progress rept. no. 20,
R. W. Longton, P. B. Carroll, and J. S. Cole, III. 2 Mar 73, 3p
Availability: Pub. in Jnl. of Dental Research, v53 n1 p144 Jan-Feb 74.

Descriptors: *Amino acids, *Dentistry, Tissues(Biology), Mouth, Response(Biology), Monkeys, Rabbits, Laboratory animals, Pathology, Humans, Streptococcus, Tissue culture, Skin(Anatomy).
Identifiers: Preventive dentistry, *Gingivitis.

Amino acids were recovered from oral microogranisms and from plaque near human gingiva. The same amino acids from a commercial source were placed on monkey gingiva, monkey skin, and rabbit skin. Amino acids filtered from plaque adjacent to clinically inflamed gingiva, and plaque near clinically noninflamed gingiva were analyzed for amino acid content. Amino acids were recovered for quantitation from filtered culture medium with pathogenic streptococci (Streptococcus sanguis 10556 and Streptococcus mutans 6715) and from filtered culture medium without metabolizing bacteria. The recovered amino acids were increased in the plaque near inflamed gingiva and were produced by oral streptococci under appropriate nutritional conditions (Todd-Hewitt broth, 5% sucrose, and 1mM ascorbic acid). (Modified author abstract)

AD-776 645/4GA Reprint
Naval Medical Research Unit No 3 Apo New York 09319 Field Facility
ELEPHANTIASIS OF THE LOWER EXTREMITIES IN ETHIOPIA: FAILURE TO IMPLICATE ONCHOCERCIASIS AS AN ETIOLOGIC AGENT BY SKIN-SNIP AND FLUORESCENT ANTIBODY STAINING TECHNIQUES,
David R. Ten Eyck. 14 Jul 73, 8p
Availability: Pub. in The American Jnl. of Tropical Medicine and Hygiene, v23 n1 p35-40 Jan 74.

Descriptors: *Filariae, Serodiagnosis, Parasitic diseases, Etiology, Ethiopia, Extremities, Fluorescent antibody techniques, Legs.
Identifiers: Onchocerciasis, Filariasis, Onchocerca volvulus, *Elephantiasis, Skin tests.

The possible role of Onchocerca volvulus infections in the pathogenesis of elephantiasis of the lower extremities was explored in an Ethiopian population using standard skin-snip and fluorescent antibody techniques. All subjects studied with the deformity who lived outside areas endemic for onchocerciasis were skin-snip negative and lacked specific antibody to onchocercal antigen. Positive skin-snip rates and mean microfilarial densities in 95 subjects with elephantiasis from areas endemic for the parasite were similar to those in subjects without elephantiasis from the same areas. No significant difference in mean sero-titers was found between infected subjects with elephantiasis and those without. The conclusion was drawn that, in this population, onchocerciasis was not related etiologically to elephantiasis of the lower extremities. (Author)

AD-776 664/5GA Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
IN VITRO STUDY OF ANTIVIRAL ACTIVITY OF IMMUNE SPLEEN CELLS IN EXPERIMENTAL VENEZUELAN EQUINE ENCEPHALOMYELITIS INFECTION IN MICE,
Stanley G. Rabinowitz, and Richard A. Proctor. 25 Oct 73, 9p
Availability: Pub. in The Jnl. of Immunology, v112 n3 p1070-1077 Mar 74.

Descriptors: *Venezuelan equine encephalomyelitis virus, *Immunology, *Antiviral agents, Arboviruses, Cells(Biology), Spleen, Mice, Experimental data, Tissue culture cells, In vitro analysis, Antigens + antibodies, Virus diseases.

VEE-immune spleen cells from C57BL/6 mice exert a potent inhibitory effect on VEE (Venezuelan Equine Encephalomyelitis) viral growth in vitro when co-cultivated with infected L cell cultures. This inhibitory effect is both immunologically specific and dependent on time of spleen cell harvest after donor immunization with attenuated VEE virus. Neither interferon nor neutralizing antibody appear to be responsible for this specific antiviral activity. Studies with purified spleen or peritoneal cell populations demonstrate that only immune macrophages alone, or the combination of immune lymphocytes with normal macrophages, are active in inhibiting VEE-virus growth in cell culture. Finally, treatment of VEE-immune spleen cells with cytotoxic antisera directed at eliminating T cells removes the inhibitory effect on VEE replication in cell culture. Hence a two-cell system involving immunocompetent T cells and activated macrophages is proposed for the inhibition of VEE viral growth. (Author)

AD-776 674/4GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
ACUTE EXERTIONAL RHABDOMYOLYSIS,
Michael A. Demos, and Eugene L. Gitin. 17 Oct 72, 10p
Revision of report dated 7 Sep 72.
Availability: Pub. in Archives of Internal Medicine, v133 p233-239 Feb 74.

Descriptors: *Muscles, Military medicine, Pathology, Physiology, Diseases, Diagnosis(Medicine), Exercise(Physiology), Blood chemistry.
Identifiers: *Rhabdomyolysis.

Forty Marine Corps recruits were hospitalized at the Naval Hospital, Beaufort, S. C., with acute exertional rhabdomyolysis following several days of excessive upper body calisthenics. After an uncomplicated hospital course, they returned to the regular training program and follow-up was continued for one year. Fluctuations of serum creatinine phosphokinase and glutamic oxaloacetic transaminase levels followed the severity of physical stresses encountered. There was no recurrence of rhabdomyolysis, and serum blood urea nitrogen levels, creatinine levels and creatinine clearance remained within normal limits. Muscle strength was initially reduced in those muscle groups affected but normal when retested 100 days later. Acute exertional rhabdomyolysis, of mild to moderate severity, is a self-limited and benign disease when diagnosed and treated accordingly. (Modified author abstract)

AD-776 835/1GA Reprint
School of Aerospace Medicine Brooks AFB Tex
MAXIMAL TREADMILL TESTING OF NORMAL USAF AIRCREWMEN,
Victor F. Froelicher, Jr., Margaret Allen, and Malcolm C. Lancaster. 1974, 8p Rept no. SAM-TR-73-344
Availability: Pub. in Aerospace Medicine, p310-315 Mar 74.

Descriptors: *Cardiovascular system, *Exercise(Physiology), Stress(Physiology), Cardiovascular diseases, Military personnel, Flight training, Electrocardiography, Medical examination, Physical fitness, Oxygen consumption.
Identifiers: Treadmill walking.

The results using the Balke maximal treadmill protocol to evaluate aircrewmen without medical or cardiovascular disease at the USAFSAM were analyzed. Two groups of men were included: 519 referral subjects who represent a sampling of the aircrew population; and, 191 special project candidates who were chosen because of exceptional characteristics and who were generally more physically active than the referral subjects. Means and standard deviations for maximal heart rate, maximal oxygen consumption and treadmill time were for maximal heart rate, maximal oxygen consumption and treadmill time were determined for the two groups by age decrements. Equations for maximal heart rate and maximal oxygen consumption regressed on age were constructed from this data and compared to the results of other investigators. The application of maximal treadmill testing at the USAFSAM was discussed. (Author)

AD-776 853/4GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
COMPUTER FILES AND ANALYSES OF LABORATORY DATA FROM TUBERCULOUS PATIENTS. I. DATA MANAGEMENT SYSTEM,
C. J. Messa, E. B. Blair, A. H. Tull, and D. H. Andres. 12 Apr 73, 6p
Revision of report dated 10 Aug 72.
Availability: Pub. in American Review of Respiratory Disease, v108 p813-818 1973.

Descriptors: *Tuberculosis, *Data management, *Mycobacterium, Mycobacterium tuberculosis, Patients, Laboratories, Data storage systems, Computers, Bacterial diseases, Infectious diseases, Records.
Identifiers: Biomedical information systems.

A data management computer system is described for all mycobacteriologic laboratory data from tuberculous patients. A laboratory data file for each patient is maintained in six records and printed out in two reports; also, laboratory quality control reports are generated monthly and semi-annually. In addition to furnishing a complete mycobacteriologic history of the patient, this file represents a significant source of research data. (Author)

AD-776 967/2GA PC$11.00/MF$1.45
Walter Reed Army Inst of Research Washington D C
RESEARCH IN BIOLOGICAL AND MEDICAL SCIENCES INCLUDING BIOCHEMISTRY, COMMUNICABLE DISEASE AND IMMUNOLOGY, INTERNAL MEDICINE, NUCLEAR MEDICINE, PHYSIOLOGY, PSYCHIATRY, SURGERY, AND VETERINARY MEDICINE. VOLUME II.
Annual progress rept. 1 Jul 72-30 Jun 73. 30 Jun 73, 594p
See also Volume 1, AD-774 860.

Descriptors: *Scientific research, *Medical research, *Military medicine, Bioinstrumentation, Biochemistry, Communicable diseases, Immunology, Internal medicine, Physiology, Psychiatry, Surgery, Veterinary medicine, Tropical medicine, Malaria, Drug abuse.

Contents:
- Tropical medicine;
- Combat surgery;
- Military internal medicine;
- Military psychiatry;
- Ionizing radiation injury, prevention and treatment;
- Malaria investigations;
- Biosensor systems;
- Biomedical factors in drug abuse.

AD-776 968/0GA PC$3.75/MF$1.45
Missouri Univ Columbia Information Science Group
MATHEMATICAL MODEL FOR DISEASE PREDICTION. COMPUTER OPERATION OF A QUALITATIVE MATHEMATICAL MODEL FOR ROCKY MOUNTAIN SPOTTED FEVER IN THE WESTERN UNITED STATES.
Interim rept.,
Lawrence C. Kingsland, III, and Donald A. B. Lindberg. Feb 74, 65p Rept no. MOU-IS-PR4
Contract DADA17-73-C-3004
Report on Theoretical Considerations of a Disease Information System. See also report dated Sep 73, AD-771 138.

Descriptors: *Rickettsia rickettsii, Epidemiology, Infectious diseases, Fevers, Mathematical models, Computer programming, United States, Predictions.
Identifiers: *Rocky Mountain spotted fever, *Disease predictions.

A computer programming system has been used to implement a Boolean logic scheme for predicting high and low disease potential for Rocky Mountain spotted fever in the western United States. Inputs to the system were attributes for the counties taken from the 'National Atlas of the United States'. With the computer decision rules, it was possible to some extent to substitute one kind of input data for another. The system offered moderately good tolerance for missing data and could give good predictions even in the face of simulated substantial practical difficulties. (Modified author abstract)

AD-777 004/3GA PC$3.75/MF$1.45
Turku Univ (Finland) Dept of Medical Chemistry
STUDIES ON PULMONARY OXYGEN POISONING AND THE ROLE OF OXYGEN IN REPAIR PROCESSES.
Final technical rept.,
Juha Niinikoski. Nov 73, 58p* Rept no. ISBN-951-99026-9-4 ERO-E-2026
Contract DAJA37-73-C-2681

Descriptors: *Oxygen, Therapy, Lung, Respiratory system, Pathology, Toxicity, Collagen, Healing, Tissues(Biology), Bones, Surgery, Physiology, Finland.
Identifiers: *Oxygen toxicity, Ischemia, Hyperbaric oxygenation.

Pulmonary oxygen toxicity, a progressive process which destroys cells in the lung, is ultimately fatal if exposure to increased oxygen pressure continues and can be stopped only by reduction of the inspired pO2 to a non-toxic level. Prolonged exposure to high oxygen tensions and resulting derangement of cellular metabolism throughout the lung lead to progressive impairment of one aspect of pulmonary function after another until the lung is no longer able to sustain an adequate gas exchange with the blood. The significance of adequate oxygen supply in healing tissues has been demonstrated both experimentally and by clinical proofs. Repair of fractures responds to changes in arterial oxygen tension, and the main targets of oxygen in healing bone appear to be the synthesis of collagen and mineralization.

AD-777 016/7GA PC$3.00/MF$1.45
Northern Arizona Univ Flagstaff Dept of Biological Science
EFFECTS OF 5-FLUOROURACIL ON ASTROCYTE DENSITY IN THE RAT SPINAL CORD DORSAL FUNICULI AFTER STAB-WOUND LESION.
Annual rept. no. 1, 1 Jun 72-31 May 73,
John Norman Grim. 23 Jan 74, 10p
Contract DADA17-72-C-2155

Descriptors: *Spinal cord, *Nerve cells, *Central nervous system, *Regeneration(Physiology), Fluorine compounds, Chemotherapy, Nerves, Wounds and injuries, Rats, Experimental data, Neurology.
Identifiers: *Fluorouracil.

Lesions of both groups contained moderate densities of astrocytes. The average density in the 5-FU treated group was less than that of the controls by 12.6% at the 95% confidence level; therefore, the chemotherapy reduced the cell density. Cell migration into the lesion is a possible explanation for the relatively small reduction in astrocyte density. With the present state of knowledge, 5-FU chemotherapy is not warranted to facilitate CNS 'nerve' regeneration. (Modified author abstract)

AD-777 034/0GA PC$3.00/MF$1.45
Armed Forces Radiobiology Research Inst Bethesda Md
UTILITY OF SERUM PROTEIN-BOUND NEUTRAL HEXOSES AND L-FOCOSE FOR ESTIMATION OF MALIGNANT TUMOR EXTENSION AND EVALUATION OF EFFICACY OF THERAPY.
Scientific rept.,
A. S. Evans, M. F. Dolan, P. Z. Sobocinski, and F. A. Quinn. Nov 73, 22p* Rept no. AFRRI-SR73-20

Descriptors: *Hexoses, *Proteins, *Cancer, *Pentoses, *Carbohydrates, Blood serum, Patients, Blood chemistry, Diagnosis(Medicine), Neoplasms, Chemical bonds, Diseases.
Identifiers: *Fucoses, Laboratory diagnosis.

A method is employed which permits correction for the influence of the neutral hexoses galactose and mannose on the apparent concentration of protein-bound L-fucose as estimated by the Dische-Shettles CyR3 reaction. The values thus obtained, together with the serum concentrations of neutral hexoses, were evaluated in a series of patients, 109 of whom had confirmed diagnoses of

cancer. While these two parameters, protein-bound neutral hexoses and protein-bound fucose, were not by themselves sufficient for differential diagnostic application, excellent correlation for presurgical estimation of tumor extension or activity and postsurgical evaluation of efficacy of treatment was achieved. (Author)

AD-777 035/7GA PC$3.00/MF$1.45
Armed Forces Radiobiology Research Inst Bethesda Md
CISTERNOGRAMS IN THE PRIMATE 'MACACA MULATTA'.
Scientific rept.,
W. J. Flor, J. S. Stevenson, N. Ghaed, and A. E. James, Jr. Nov 73, 17p* Rept no. AFRRI-SR73-21

Descriptors: *Cerebrospinal fluid, *Neurology, Nervous system diseases, Diagnostic agents, Diagnosis(Medicine), Images, Scanning, Brain, Fluid flow, Anatomy, Physiology, Pathology, Primates, Models.
Identifiers: Macaca mulatta, *Cisternography, *Radiopharmaceuticals, Hydrocephalus.

Normal imaging of cerebrospinal fluid (CSF) flow in the primate Macaca mulatta using 99mTc labeled human serum albumin shows flow from the basal cisterns over the cerebral cortex in four hours. Anatomical correlation of basal cisterns with cisternographic images was demonstrated with latex casts of the normal CSF spaces. Cisternographic images from nonhuman primates with experimental communicating hydrocephalus have entry of radiopharmaceutical into the lateral ventricles and are presented for comparison. Cisternography is a useful technique for evaluating such primate disease models, since normal and pathologic images parallel those obtained in man. (Author)

AD-777 036/5GA PC$3.25/MF$1.45
Armed Forces Radiobiology Research Inst Bethesda Md
LOCAL GRAFT VERSUS HOST REACTION SUPPRESSED BY IMMUNOBLOCKING ANTIBODY SECRETED BY ANTIBODY-FORMING CELLS TRANSFERRED WITH THE GRAFT.
Scientific rept.,
M. P. Fink, C. L. Cloud, and K. F. McCarthy. Nov 73, 31p* Rept no. AFRRI-SR73-22

Descriptors: *Surgical transplantation, Immunology, Antibodies, Spleen, Cells(Biology), Sensitivity, Donors(Medicine), Immunization.
Identifiers: *Immunosuppression, Graft versus host disease.

The purpose of the study was to test the hypothesis that the reduction in graft versus host (GVH) activity following donor sensitization is due to active enhancement and, furthermore, that the immunosuppression is mediated by antibody secreted by cells transferred with the graft. To this end, the popliteal lymph node (PLN) assay was used to measure the GVH reactivity of parental rat spleen cells injected into adult F1 hybrid recipients. Immunization of the donor with an intravenous injection of hybrid spleen cells resulted in a reduction in GVH reactivity. The magnitude of the immunosuppression depended upon the interval between immunization and assay and was associated with the level of cytotoxic antibody in the serum of the donor. Using velocity sedimentation to separate immunized spleen cells, the authors were able to show that cells from the fraction enriched in antibody-forming cells (AFC) can inhibit the GVH reactivity of normal spleen cells.

AD-777 058/9GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
IMMUNOGLOBULIN LEVELS IN MALNOURISHED CHILDREN.
Technical rept.,
Lawrence J. Casazza, 1972, 11p Rept no. NAMRU-2-TR-584
Availability: Pub. in Paediatrica Indonesiana, v12 p263-270 Jun 72.

Descriptors: *Immunoglobulins, *Malnutrition, Children, Immunity, Infectious diseases, Nutrition, Indonesia.

Immunoglobulin (IgA, IgG, IgM) determinations were carried out in 213 children aged 6-36 months at the Depart of Child Health, Medical School, University of Indonesia, Jakarta. The malnourished group demonstrated more rapid development toward adult levels after initial lower starting points. The significance of these findings is briefly discussed. (Author)

AD-777 059/7GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
EVALUATION OF THICK SMEAR, KNOTT AND MEMBRANE FILTRATION METHODS FOR DEMONSTRATING MICROFILARIAE IN BLOOD.
Technical rept.,
Felix Partono, John H. Cross, 8 Nov 72, 8p Rept no. NAMRU-2-TR-585
Availability: Pub. in Tropical and Geographical Medicine, v25 p286-289 1973.

Descriptors: *Filariae, Parasitic diseases, Nematoda, Blood analysis, Detection, Test methods, Membranes, Filtration.
Identifiers: Wuchereria bancrofti, *Microfilariae.

An elevation was made on the detection of Wuchereria bancrofti microfilariae in a 20 cmm thick blood smear, 1 ml aliquots of venous blood examined by the Knott technique and 1 ml of venous blood examined by membrane filtration. A total of 105 people were examined; 12 known Wuchereria bancrofti microfilaria carriers, 73 symptomatic patients and 21 asymptomatic individuals that lived in the same household with patients in the other two groups. Microfilariae were detected in 20% of the individuals by thick smear and 27% by both Knott and membrane filtration methods. Only 16% of those with clinical filariasis demonstrated microfilaremia and in all cases greater numbers of microfilariae were detected by membrane filtration than by the other two methods. (Author)

AD-777 060/5GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
MALARIA AND FILARIASIS IN A TRANSMIGRATION VILLAGE EIGHT AND TWENTY-TWO MONTHS AFTER ESTABLISHMENT.
Technical rept.,
Felix Partono, John H. Cross, 1973, 8p Rept no. NAMRU-2-TR-586
Availability: Pub. in The Southeast Asian Jnl. of Tropical Medicine and Public Health, v4 n4 p484-486 Dec 73.

Descriptors: *Malaria, *Indonesia, Parasitic diseases, Filariae, Parasitic diseases, Public health, Culicidae, Surveys, Population, Epidemiology.
Identifiers: *Filariasis, Mosquitoes, Plasmodium vivax, Plasmodium falciparum, Brugia malayi.

Two surveys for malaria and filariasis were made in Sindubinangun, Margolembo, Luwu Regency, South Sulawesi, Indonesia eight months and twenty-two months after the arrival of transmigrants from Central Java. During the fourteen months between surveys, the prevalence rate for malaria (Plasmodium vivax and Plasmodium falciparum) decreased from 32.6% to 23.2% while the filarial disease rate (Brugia malayi) increased from 1.3% to 6.5%. The problems associated with these diseases, the effects on the populace, and the future development of transmigration areas are briefly discussed.

COM-74-10871/9GA PC$3.25/MF$1.45
North Carolina Univ., Chapel Hill. Inst. of Applied Business and Economic Research.
PHYSICIANS, HOSPITALS, AND DEMAND FOR HEALTH CARE SERVICES IN THE SOUTHEASTERN UNITED STATES,
Richard F. Wacht. May 73, 44p* EDA/OER-74-115
Grant EDA-OER-224-G-68-12
Prepared in cooperation with Georgia State Univ., Atlanta.

Descriptors: *Medical services, *Physicians, Recommendations, Medical personnel, Southeast United States, Manpower, Incentives, Hospitals, Statistical analysis, Economic factors, Distribution(Property), Economic factors, Requirements.
Identifiers: *Health care delivery, Health service research and development, *Community health services.

The major purpose of the study relates to the fact that the maldistribution of physicians cannot be corrected by 'approximating' the problems out of existence in the same way legislatures attempt to eliminate absolute shortages of doctors and material health care resources. Instead, physicians must be provided with incentives that will cause them to permanently relocate their practices in medically depressed areas. Thus, the purpose of this study is to provide planners with some insight into the kinds of incentives that are likely to produce desired results. Since the practice of medicine varies significantly among physicians, the second purpose of this study is to identify differences in the relationships between physician location and the economic-based determinants inherent in the geographic areas examined.

CONF-731045-1 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
EXPERIMENTAL APPROACHES TO THE IDENTIFICATION OF CARCINOGENIC AIR CONTAMINANTS.
P. Nettesheim. 1973, 8p

Descriptors: (*Carcinogens, *Inhalation), (*Carcinogenesis, *Biological models), Air pollution, Mammals, Respiratory system.

For abstract, see NSA 29 07, number 17979.

CONF-731125-1 PC$4.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
BALANCE OF HOST IMMUNOCOMPETENCE IN CHEMICAL CARCINOGENESIS AND NONSPECIFIC IMMUNOTHERAPY.
M. G. Jr. Hanna, A. K. Szakal, and L. C. Peters. 1973, 49p

Descriptors: (*Neoplasms, *Immune reactions), Antigens, Biological effects, Carcinogens, Cell proliferation, Guinea pigs, Therapy.

For abstract, see NSA 29 07, number 17980.

N74-16828/4GA PC$5.25/MF$1.45
Techtran Corp., Glen Burnie, Md.
RESISTANCE AND DISEASE. PROBLEMS OF GENERAL PATHOLOGY.
P. D. Gorizontov. Feb 74, 45p NASA-TT-F-15314
Contract NASW-2485
Tran-Transl. Into English from Patol. Fiziol. Eksteemal'Nykh Sostoyaniy, (Moscow), 1973 p 7-35.

Descriptors: *Diseases, *Human body, *Human pathology, *Immunity, Adaptation, Aerospace medicine, Physiological defenses, Resistance, Stress (Physiology).

For abstract, see STAR 1208

PB-229 253/0GA PC$4.00/MF$1.45
Yale Univ. Lung Research Center, New Haven, Conn.
LUNG DISEASES IN RURAL AND URBAN COMMUNITIES.
Annual rept. 1 Sep 72-31 Aug 73,
Arend Bouhuys, and Charles Mitchell. Sep 73, 92p NIH/NHLI-73-2904-A73

Contract PHS-73-2904

Descriptors: *Respiratory diseases, Epidemiology, Environmental surveys, Populations, Genetics, Rural areas, Urban areas, Connecticut, Air pollution.
Identifiers: *Chronic obstructive lung disease, *Health surveys.

A mobile laboratory was equipped with a minicomputer and two terminals for field studies in communities, and used in Lebanon and Ansonia, Connecticut. The authors obtained data on respiratory symptoms and lung function on 4000 people. Experiences have shown that this facility is successful in a technical sense, and that it is possible to gain the confidence of large sections of the population of a community and thus achieve a high response rate in such studies. Environmental data on community air pollution was obtained in Lebanon and Ansonia, Connecticut, measuring particulate matter, sulfur dioxide, nitrogen oxides and oxidants in the general atmosphere at five points in Lebanon and at three points at different altitudes in Ansonia.

PB-229 402/3GA PC$4.00/MF$1.45
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
THE INVERSE PROBLEM OF ESTIMATING HEART PARAMETERS FROM X CARDIOGRAMS.
Technical rept.,
R. Bellman, B. Kashef, and R. Vasudevan. Apr 73, 17p RB73-14
Grant PHS-GM-16197-05

Descriptors: *Electrocardiography, *Vectocardiography, Cardiography, Biomedical measurement, Heart, Simulation, Linear differential equations, Numerical analysis.
Identifiers: Computer aided analysis.

A model of the electrical activity of the heart relating the ventricular dipoles to cardiogram measurements naturally leads to the inverse problem of estimating the heart parameters from the observation of skin potentials. The quasilinearization method for handling this multipoint boundary value problem necessitates the use of an initial guess for some of the parameters and the use of a large digital computer for the solution of a large system of linear equations. An alternate technique involving differential quadrature which obviates the use of any initial guess, is feasible. In this technique, a small on-line computer will produce the results on a real-time basis for as many as 20 myocardial segments. The details of this procedure and some numerical experiments form the contents of this article.

PB-229 403/1GA PC$4.50/MF$1.45
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
CANCER, COMPUTER AND CONTROL THEORY: A PROSPECTUS FOR THE NEXT HUNDRED YEARS.
Technical rept.,
R. Bellman. Mar 73, 26p RB73-5, USC-113P19-42
Grants PHS-GM-16197-05, NSF-GP-29049
Also Supported by Atomic Energy Commission Contract No. AT(04-3)-113.

Descriptors: *Malignant neoplasms, *Control theory, Applications of mathematics, Physiology, Computers, Forecasting, Diseases.
Identifiers: *Cancer, Medical computer applications.

The paper is divided into a number of parts. The first part describes briefly how one can use systems theory to predict. It is indicated why this procedure directs attention to human systems and medicine as principal areas over the next hundred years. Interest in the mathematical theory of control focuses attention on cancer, and then a discussion of a number of the individual control processes imbedded in the cancer complex follows. The principal contention is that understanding of cancer as a disease lies in a mixture of physiology and control theory. Also emphasized is that all aspects of prevention, detection, diagnosis, cure and palliation involve control processes.

PB-229 675-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
CYTOLOGICAL DIAGNOSIS OF REACTIVE CHANGES IN THE BRONCHIAL EPITHELIUM,
M. G. Shcherbakova, and V. G. Rukavishnikova.
Feb 74, 12p NIH-74-206C
Trans. of Voprosy Onkologii (USSR) v19 n8 p34-42 1973.

Descriptors: *Pulmonary neoplasms, Diagnosis, Morphological changes, Epithelium, Bronchi, Respiratory diseases, USSR, Translations, Histology, Pathology, Cytology, Sputum, Patients.
Identifiers: Hyperplasia.

Cytological analysis of sputum and bronchial smears from 278 patients with chronic nonspecific inflammatory lung diseases were examined for suspected lung cancer. The reactive changes that were observed allowed for cytological characteristic determination for different forms of lung cancer. The reactive changes of basocellular hyperplasia are especially noted as presenting difficulties in the evaluation of differential diagnostic criteria. Cytological study of the sputum and bronchial smears with complex consideration of reactive and dystrophic changes of the bronchial epithelium, cellular background of the sputum, medical history and clinical data make it possible to assess the nature of the disease as well as the dynamics of its development.

PB-229 760/4GA PC$3.75/MF$1.45
Medical Coll. of Virginia, Richmond. Health Sciences Div.
THE PROCUREMENT AND CHARACTERIZATION OF POST RENAL TRANSPLANT REJECTION SERUM.
Final rept. 16 Jan 68-28 Feb 74,
James C. Pierce. Feb 74, 54p*
Contract PH-43-68-659
See also report dated PB-190 596.

Descriptors: *Kidneys, *Surgical transplantation, *Antibodies, Immunology, Antigens, Serology, Cells(Biology), Lymphocytes, Tissues(Biology).
Identifiers: *Tissue typing, Histocompatibility.

A histocompatibility typing center was established which typed prospectively for cadaveric and living related human renal transplants and retransplants. Several different tissue typing techniques used in cross-matching and detecting pre-formed cytotoxic antibodies were evaluated using known typing sera and cadaver donor kidney cells versus lymphocytic to enhance the sensitivity of prediction of graft survival or rejection. Post transplant rejection sera were characterized for their antibody content. Significant results indicate that the anti-globular test employing donor kidney cells is the most sensitive in cross-matching prior to kidney transplant and in detecting preformed circulating HL-A antibodies.

PB-229 812/3GA PC$3.25/MF$1.45
Mayo Foundation, Rochester, Minn.
VALUE OF MAINTAINING PARATHYROID HORMONE SUPPRESSIVE CALCEMIA IN PREVENTION OF BONE DISEASES AND ABNORMALITIES IN CALCIUM HOMEOSTASIS IN PATIENTS ON LONG-TERM HEMODIALYSIS.
Annual progress rept. 25 Aug 72-13 Aug 73,
R. S. Goldsmith, W. J. Johnson, and C. D. Arnaud. 13 May 73, 31p AK-4-69-2168
Contract PHS-69-2168
See also PB-205 092.

Descriptors: *Uremia, *Artificial kidneys, *Calcium, *Musculoskeletal disorders, Urologic diseases, Nutrition, Metabolism, Phosphorus, Parathyroid hormone, Tables(Data).
Identifiers: *Hemodialysis, Osteitis fibrosa cystica, Creatinine.

Long-term treatment of patients with chronic renal insufficiency has been carried out by increasing the dialysate calcium concentration to 7-8 mg/dl and decreasing the plasma phosphorus concentration to < 6 mg/dl. With this regimen, the authors have been able consistently to decrease plasma concentrations of iPTH and to reverse roentgenographic and histologic evidences of active osteitis fibrosa. Recent examination of plasma concentrations of 25(OH)D in these patients showed some significant correlations, but full interpretation must await completion of kinetic analysis.

PB-229 867/7GA
Mag Tape $157.50;Foreign $197.50
Bureau of Radiological Health, Rockville, Md. Office of Data Systems and Mathematics.
COOPERATIVE THYROTOXICOSIS THERAPY FOLLOW-UP STUDY.
Data file,
Loren Mills. 19 Jun 73, 2 reels mag tape FDA/DF-73-013
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Hyperthyroidism, *Leukemias, *Radiotherapy, *Information systems, Iodine 131.

The thyrotoxicosis study was initiated in 1961 to test for an increase in the incidence of leukemia in hyperthyroid patients treated with iodine-131. Twenty-two study centers representing twenty-six medical institutions submitted records on 36,000 patients treated for hyperthyroidism in the period January 1946 through December 1964. Source documents are questionnaires sent to twenty-two study centers which represented twenty-six medical institutions. Data were thereby acquired on 36,000 patients treated for hyperthyroidism.

PB-229 897/4GA PC$3.00/MF$1.45
Jewish Hospital, St. Louis, Mo.
BONE METABOLISM IN CHRONIC UREMIA.
Annual rept. 1 Jul 70-1 Dec 73,
Louis V. Acioli, and Jean E. Russell. 1 Dec 73, 15p* AK-1-70-2219
Contract PHS-70-2219

Descriptors: *Uremia, *Bones, *Collagens, Metabolism, Minerals, Biosynthesis, Musculoskeletal system, Vitamin D group, Nutrition, Biochemistry, Biophysics.

Detailed biochemical and biophysical analyses of skeletal tissue during the genesis of the chronic uremic state in rats have uncovered a maturational defect in the biosynthesis of collagen and in the transitional states of bone mineral. These changes develop progressively with advancing uremia, are associated with defective metabolism of vitamin D and its biologically active 25-hydroxycholecalciferol (25HCC) metabolite and can be reversed toward normal by 25HCC therapy.

PB-229 902/2GA PC$3.75/MF$1.45
Veterans Administration Hospital-Wadsworth, Los Angeles, Calif.
NITROGEN METABOLISM IN UREMIA.
Annual rept. 5 Nov 72-4 Nov 73,
Joel D. Kopple, and Marian E. Swendseid. 5 Nov 73, 75p* AK-1-73-2210
Contract PHS-73-2210
See also PB-203 956.

Descriptors: *Uremia, *Protein metabolism, *Artificial kidneys, Amino acids, Nutrition, Physiology, Muscles.
Identifiers: *Hemodialysis.

In muscle of chronically uremic patients, essential amino acid levels tend to be higher and methionine, histidine and 1- and 3-methylhistidine were significantly increased as compared to normals. The ratio of tyrosin/phenylalanine was significantly decreased in muscle of chronically uremic patients. Evidence is presented that histidine is an essential amino acid in chronically uremic and normal subjects. In the absence of dietary histidine, decreased histidine pools, a catabolic state, an anemia associated with failure of normal erythropoiesis and a clinical syndrome occur. Isotopic studies indicate that there is a block in the conversion of phenylalanine to tyrosine in chronic uremia. The relation between the appearance of abnormal tyrosin/phenylalanine ratios in plasma and the degree of impairment of renal function provides evidence that the defect in tyrosine and phenylalanine metabolism in uremia is due to impairment of a non-excretory activity of the kidney.

PB-229 905/5GA PC$3.75/MF$1.45
Mayo Clinic, Rochester, Minn.
UREMIC NEUROPATHY.
Annual progress rept. 17 Apr 73-16 Apr 74,
Peter James Dyck, Ralph D. Ellefson, William J. Johnson, and Edward H. Kanbert. 1 Nov 73, 75p* AK-1-72-2200
Contract PHS-72-2200

Descriptors: *Neurology, *Uremia, *Bioinstrumentation, Thermoreceptors, Touch, Skin(Anatomy), Lipids, Lipoproteins, Nerves, Conductivity.
Identifiers: *Hemodialysis.

Contents:
- Instrumentation and quantitation of cutaneous sensation;
- Comparative trial of two schedules of diet, fluid and dialysis on peripheral nerve function;
- Histologic, histometric, axonal flow, and lipid analysis.

PB-229 926/1GA PC$3.25/MF$1.45
Research Triangle Inst., Durham, N.C.
THE NATIONAL DIALYSIS REGISTRY. DEVELOPMENT OF A MEDICAL REGISTRY OF PATIENTS ON CHRONIC DIALYSIS.
Annual progress rept. no. 5, 1 Jul 72-1 Oct 73,
F. A. Bryan, Jr. Oct 73, 33p AK-5-67-1387
Contract NO1-AM-7-1387
See also PB-213 303.

Descriptors: *Renal failure, *Dialysis, *Directories, Data processing, Data acquisition, Patients, Mortality, Information retrieval, Statistical analysis, Artificial kidneys, Tables(Data), Medical records.
Identifiers: *Hemodialysis.

The National Dialysis Registry is the product of a contract for the development of a medical registry of patients on chronic dialysis. In this report, methods of data collection and process procedures are described. Tables are presented showing results as of October 1, 1973 and as of July 1, 1972 of the Statistical Analysis on Reporting Dialysis Centers. Other statistical analyses of Registry data are described which include distributions of patient load by center size and by quartile ranking of center size. Death analyses are also presented which indicate primary causes of death, average age and duration on dialysis by primary cause of death, number of patients by duration of dialysis, duration of dialysis by age when beginning dialysis, and age at death, and numbers of deaths per year of patient exposure by size of center. Results of some special demographic and survivorship analyses are shown.

PB-229 949/3GA PC$3.75/MF$1.45
Minneapolis Medical Research Foundation, Inc., Minn.
COMPUTERIZED DATA BANK TO ASSESS ADEQUACY OF DIALYSIS.
Annual progress rept. 28 Feb-1 Nov 73,
Fred L. Shapiro. 1 Nov 73, 58p* AK-1-72-2225-A
Contract PHS-72-2225
See also PB-219 386.

Descriptors: *Artificial kidneys, *Urologic diseases, Dialysis, Uremia, Therapy, Evaluation, Statistical analysis, Data processing, Data storage, Information systems, Computers, Drug therapy, Steroids.
Identifiers: *Hemodialysis, Computer aided analysis, Nandrolone decanoate.

Dialysis patients were studied for three months at QD 200 and three months at QD 500 in a crossover designed study. No statistically significant differences were detected in clinical or laboratory parameters during the study. Decadurabolin administered to regularly dialyzed patients caused two effects: increased hematocrit in patients with kidneys; and an anabolic effect resulting in increased serum albumin in both anephric and nephric patients. A computerized data system has been further refined to be of more assistance in clinical and research dialysis related activities.

PB-230 233/9GA
Mag Tape $157.50;Foreign $197.50
National Library of Medicine, Bethesda, Md.
MEDICAL LITERATURE ANALYSIS - RETRIEVAL SYSTEMS (MEDLARS) - PILOT TAPES,
Joseph Leiter. 29 Mar 74, 2 reels mag tape
Specify tape recording mode desired: 7 track, 556 or 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Information retrieval, *Data tapes, Medicine, Data storage.
Identifiers: *MEDLARS, *Biomedical information systems.

The two reel magnetic tape file contains a sampling of the Citations file indexed for the Medical Literature Analysis-Retrieval system and the Dictionary file to facilitate use of the Citation file. The entire data base is available via negotiation with NTIS and the National Library of Medicine.

PB-230 488/9GA PC$12.50/MF$1.45
Purdue Univ., Lafayette, Ind. Water Resources Research Center.
INDIANA 1950-1970: LIFE TABLES FOR THE 14 ECONOMIC REGIONS AND ANALYSIS WITH MEASURE OF MEDICAL CARE.
Master's thesis,
Edward Raymond Cooper. Aug 72, 189p W74-05952, OWRR-C-3277(3713)(2)

Descriptors: *Indiana, *Population statistics, *Medical services, Life span, Age, Mortality, Demography, Theses, Rural areas, Urban areas, Infants, Physicans, Hospitals.

Life tables were constructed for the 14 economic regions of Indiana in census years 1950 and 1970. Dependent variables were the following life table functions: infant mortality, expectation of life at birth, and expectation of life at age 65. Independent variables were urban population and the measures of medical care; physicians, hospital beds, patients admitted, patient days, occupancy rate for hospitals, and usage rate for hospitals. In 1950 there were urban-rural differences. However, it is significant that mortality is lower and expectation of life higher in the more rural economic regions. There were no urban-rural differences in 1960 or 1970, yet the variation in mortality and expectation of life among the economic regions increases. There is greater variation among the regions in 1970 than in 1950. Among the economic regions the larger the quantities of the four medical care variables the higher is mortality and the lower is expectation of life.

PB-230 959/9GA PC$4.00/MF$1.45
Urban Observatory of Metropolitan Nashville-Univ. Centers, Tenn.
DESIGN TO ESTABLISH A FEASIBLE PLAN FOR ENERGENCY MEDICAL CARE, IN THE METROPOLITAN NASHVILLE-MIDDLE TENNESSEE REGION.
Final rept.,
Charles E. Goshen, Billey R. Talbert, Abbie G. Watson, and William R. Baker. Jun 70, 20p UO-LCCM-NASH-70-008
Contract HUD-H-987

Descriptors: *Medical services, *Tennessee, Hospitals, Ambulances, Telecommunication, Medical personnel, Information, Design, First aid.
Identifiers: *Emergency medical care, Health services research and development, *Health care delivery systems, *Housing and urban development research.

The need is shown for coordination and integration of existing health-care facilities to increase efficiency and allow geographical expansion of emergency medical services. The proposed design describes both available and needed software (system design charts, personnel) and hardware (air and ground vehicles, data and communication systems) in three major areas: hospital-medical services, communication-information, and ambulance/on-site services. Links are needed with other agencies (police, fire) for coordination and supplemental information (e.g. traffic, road and weather status). The recommended plan has been implemented and is now operational in middle Tennessee.

6F. Environmental Biology

AD-776 410/3GA PC$3.00/MF$1.45
Salford Univ (England) Dept of Biology
THE INSECT VECTORS OF TRYPANOSOMIASIS IN UGANDA AND THEIR CONTROL.
Final technical rept.,
William Raymond Wooff. Sep 73, 5p
Contract DAJA37-73-C-0577

Descriptors: *Trypansoma, *Disease vectors, *Insect control, Infectious diseases, Zoomastigina, Ecology, Humans, Diptera, Insecticides, Protozoa, Epidemiology, Public health, Parasitic diseases, Great Britain.
Identifiers: Trypanosomiasis, *Sleeping sickness, *Glossina, Tsetse flies, Uganda.

The object of the brief handbook is to describe not only those insects which in Uganda are the cyclic and potential mechanical vectors of trypanosomiasis but also the methods used in that country for controlling them.

AD-776 897/1GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
EVALUATION OF NEW LIGHT SOURCES AS MOSQUITO ATTRACTANTS.
Final rept.,
R. W. Vavra, Jr., and E. Scott Tomlinson. Mar 74, 16p Rept no. LWL-TR-74-35

Descriptors: *Culicidae, *Insect control, Cost analysis, Pest control, Light sources, Entomology, Neon tubes, Incandescent lamps.
Identifiers: *Mosquitoes, *Attractants, Evaluation, Recommendations, *Light traps.

The Entomology Department, US Army Medical Laboratory, evaluated the following prototype light sources for replacement of the standard battery operated incandescent lamp in the CDC mosquito light trap. Lamps include chemlites (chemicaluminescent lights), betalights, and blinking miniature neon lamps. Field tests were conducted in the Pocomo Swamp, Maryland, and the Panama Canal Zone. Test results indicate that the chemlite attracted a comparable number of mosquitos and could be economically superior to the standard battery powered incandescent lamp.

All other prototype lamps were inferior in their attractant capabilities when compared to the standard light source. The blinking neon lamp developed physical problems which hindered its evaluation. (Modified author abstract)

AD-777 044/9GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
PREFERENCE OF 'MANSONIA UNIFORMIS' (THEOB.) FOR SPECIFIC WATER HYACINTH PLANTS.
Technical rept.,
John L. McDonald, and L. C. Lu. Sep 73, 7p Rept no. NAMRU-2-TR-580
Availability: Pub. in Mosquito News, v33 n3 p466-467 Sep 73.

Descriptors: *Culicidae, *Aquatic plants, Ecology, Hosts(Biology), Larvae, Southeast Asia.
Identifiers: Mansonia uniformis, *Mosquitoes, *Water hyacinth.

Mansonia uniformis 4th instar larvae demonstrate a preference for attaching to live water hyacinth rather than dead ones and flowering rather than nonflowering plants. It is not clear whether the specific plants attract the mosquito immatures or the mosquito immatures move randomly though the water and preferentially attach to one type of plant rather than another. This is not to say that all the various species of plants which are hosts to M. uniformis would have a similar relationship. These answers can be obtained only when different species of Mansonia and their reaction to various host plants can be observed. However, due to the abundance of M. uniformis and water hyacinth in Southeast Asia, the information presented may aid in simplifying the search for M. uniformis breeding sites. (Author)

COM-74-50272/5GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
ABUNDANCE AND DISTRIBUTION OF INSHORE BENTHIC FAUNA OFF SOUTHWESTERN LONG ISLAND, N.Y.
Technical rept.,
Frank W. Steimle, Jr., and Richard B. Stone. Dec 73, 55p NOAA-TR-NMFS-SSRF-673 NOAA-74031101
Paper copy available from GPO $0.35 as C55.13:NMFS SSRF 673.

Descriptors: *Long Island Sound, *Aquatic animals, New York, Distribution(Property), Abundance, Ecology, Benthos, Water pollution, Waste disposal.

The paper describes a qualitative and quantitative census of the inshore benthic fauna off southwest Long Island over the period February 1966 through January 1967, prior to construction of an ocean sewer outfall in the general vicinity. Preliminary analysis of data indicate the presence of three distinct communities: (1) an inshore medium to coarse grain sand community dominated by the bivalve, Tellina agilis, the amphipod, Protohaustorius deichmannae, and the echinoderm, Echinarachnius parma; (2) an offshore silty fine sand community dominated by the bivalve, Nucula proxima, and the polychaete, Nephtys incisa; and (3) a community dominated by the blue mussel, Mytilus edulis. (Author)

EDFB-IBP-73-8 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ENERGY FLOW AND NUTRIENT CYCLING IN A CRYPTOZOAN FOOD-WEB.
J. F. McBrayer, D. E. Reichle, and M. Witkamp. Jan 74, 78p
Contract W-7405-eng-26

Descriptors: (*Food chains, *Energy transfer), (*Forests, *Ecology), (*Arthropods, *Nutrients), Biological models, Calorimeters, Invertebrates.

For abstract, see NSA 29 07, number 17965.

PAT-APPL-368 280 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
BOLL-WEEVIL SEX ATTRACTANT.
Patent Application,
Richard C. Gueldner, James H. Tunlinson, III, Paul A. Hedin, and Alonzo C. Thompson. Filed 14 May 73, 15p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Pest control, *Insect control, Reproductive system, Sex hormones, Cotton plants.
Identifiers: PAT-CL-424-93, *Boll weevil eradication, Attractants.

In the patent application synthetic routes to each of four critical components of the boll-weevil sex attractant complex are described. Effective mixtures of the several components equal to or better than the natural attractant are disclosed. Portions of this document are not fully legible.

PATENT-3 271 246 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF CONTROLLING SEA LAMPREY.
Patent,
John H. Howell, and Everett L. King, Jr. Filed 6 Jan 64, patented 6 Sep 66, 6p PAT-APPL-336 079,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Lampreys, *Pesticides, *Patents, Pest control, Larvae, Great Lakes, Toxicity, Trout, Effectiveness, Nitrophenols, Selectivity, Salicylamides.
Identifiers: PAT-CL-167-46, Petromyzon marinus, Larvacides, Phenol/nitro-trifluoromethyl, Niclosamide.

The invention relates to control of the sea lamprey (Petromyzon marinus), and more particularly, to chemical treatment of aquatic habitats in which the larval stage of the lamprey lives and grows. It is therefore an object of the invention to provide a larvicide which will effect a substantially complete eradication of larval lampreys in a water course without causing significant harm or mortality of game and food fish. It has now been found that this may be achieved by means of a synergistic combination of 3-trifluormethyl-4-nitrophenol (TFM) and 2',5-dichloro-4'-nitrosalicyl-anilide.

PATENT-3 702 359 Not available NTIS
Department of Agriculture, Washington, D.C.
CERTAIN MICROBIAL INSECTICIDES AND METHODS OF PREPARATION THEREOF.
Patent,
Howard T. Dulmage, Jose A. Correa, and Adelaido J. Martinez. Filed 30 Oct 70, patented 7 Nov 72, 6p PAT-APPL-85 787,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Insecticides, Microorganisms, Viruses, Bacillus, Preparation.
Identifiers: PAT-CL-424-93, Biological insect control, Bacillus thuringiensis.

The patent describes two biological insecticides and method of preparation. In the one method polyhedral inclusion bodies of the nuclear polyhedrosis virus of the cabbage looper, Trichoplusia ni, were precipitated from concentrated suspensions in 4-6% solutions of lactose upon addition of acetone. Alternate steps to the method of preparation are also provided. A dry resuspendable product (in water) is obtained. In the second method, the spore-crystalline toxin complex of Bacillus thuringiensis was precipitated from concentrates derived from fermentation beers resuspended in 4-6% lactose upon addition of acetone. A dry powder containing the crystalline toxin live spore complex is thus provided.

PB-229 680/4GA PC$5.75/MF$1.45
Maine Univ., Orono.
AN INVESTIGATION OF THE EFFECTS OF DDT AND OTHER CHLORINATED HYDROCARBON ON THE GROWTH OF EURYHALINE MICROALGAE.
Completion rept. Jul 70-Jun 72,
Robert L. Vadas. Jun 72, 51p W74-05407, OWRR-A-021-ME(1)

Descriptors: *Algae, *Chlorohydrocarbons, *Pesticides, Aquatic plants, Cytology, DDT, Dieldrin, Insecticides, Growth, Tolerances(Physiology), Photosynthesis, Salinity, Experimental data.
Identifiers: Euryhaline, Water pollution effects(Plants), Porphyridium, Platymonas subcordiformis.

The research project was initiated to determine the effects of chlorinated hydrocarbons at various concentrations on the growth of euryhaline microalgae, to determine if resistance to DDT occurs in algae with short generation times and with wide tolerances to naturally occurring environmental conditions, and to determine photosynthetic rates for algae treated with chlorinated hydrocarbons. Extensive studies on the effects of DDT on the growth of Platymonas subcordiformis indicate that some degree of resistance occurs naturally in the alga and that depressions in the carrying capacities and in growth rates, especially, in the form of lags, are common at sublethal levels. Growth rates were adversely affected by DDT concentrations at 100 to 200 ppb. At 500 ppb cells never recovered within the experimental period (7 to 10 days). Studies on the effects of DDT at varying salinity levels suggest that cells are less resistant to DDT at higher salinities (22 to 30 PPT).

PB-229 781/0GA PC$12.00/MF$1.45
Academy of Natural Sciences of Philadelphia, Pa.
THE DELAWARE ESTUARY SYSTEM, ENVIRONMENTAL IMPACTS AND SOCIO-ECONOMIC EFFECTS. DELAWARE RIVER ESTUARINE MARSH SURVEY.
Final rept.,
Thomas E. Walton, III., and Ruth Patrick. Dec 73, 177p NSF-RA/E-73-013
Grant NSF-GI-33369
Prepared in cooperation with Rutgers-The State Univ., New Brunswick, N.J., and Delaware Univ., Newark.
Paper copy also available from NTIS $23.00/set of 3 reports as PB-229 780-SET.

Descriptors: *Delaware River Estuary, *Environmental surveys, *Swamps, Vegetation, Maps, Benthos, Water pollution.
Identifiers: Salt marshes, Fresh water marshes.

One of the purposes of this study was to delineate the important marshlands in the Delaware estuary and to describe them in terms of their more common emergent vegetation. Another was to identify the impacts resulting from human activities which might contribute to perturbation of any of these marshes. Finally, the aquatic life in each of the marsh areas was examined in order to obtain indications of the kinds of aquatic communities they would support and the extent to which they have been disturbed.

PB-229 831/3GA PC$4.75/MF$1.45
Kentucky Water Resources Inst., Lexington.
A STUDY OF WATER-SOLUBLE INHIBITORY COMPOUNDS (ALGICIDES) PRODUCED BY FRESH-WATER ALGAE.
Research rept.,
Denny O. Harris, and Manhar C. Parekh. Nov 73, 35p RR-69 OWRR-A-018-KY(6), W74-05537
Contracts DI-14-01-0001-1085, DI-14-01-0001-1636

Descriptors: *Algicides, *Chlorophyta, Algae, Growth regulators, Inhibitors, Aquatic plants, Chemical properties, Physical properties, Stability.

Identifiers: Pandorina morum, Volvox tertius, *Aquatic weed control.

A complex system of growth inhibitors was observed in the green algae (Volvocaceae). Inhibitors were found in the culture filtrates of some genera which limit their own growth (auto-inhibitors) while others in the family produce substances which check the growth of other genera (heteroinhibitors). These inhibitors were destroyed by autoclaving. It was decided that Pandorina morum, which produced the strongest inhibitor and Volvox tertius, the most sensitive to the inhibitor would make an excellent model system for a study of the chemical and physical properties of these naturally occurring algicides.

PB-229 849/5GA PC$10.50/MF$1.45
Illinois Univ., Urbana. Water Resources Center.
ECOLOGY OF FLOODPLAIN POOLS IN THE KASKASKIA RIVER BASIN OF ILLINOIS.
Final rept.,
R. Weldon Larimore, Edward C. Doyle, and Allison R. Brigham. Dec 73, 148p WRC-RR-75, UILU-WRC-73-0075 OWRR-B-025-ILL(2),, W74-05536
Contract DI-14-31-0001-1897

Descriptors: *Kaskaskia River, *Flood plains, *Ecology, Illinois, Water chemistry, Aquatic biology, Plankton, Benthos, Fresh water fishes, Food chains, Aquaculture, Biological productivity, Ponds, Nutrients.

The waters considered in this investigation are shallow pools in the floodplain of the Kaskaskia River that connect with the river during periods of high stream flow. The objectives were to determine the chemical and biological relationships between floodplain pools and the river, to ascertain what river fishes depend on the floodplain pools for spawning sites and their food supplies, to establish useful techniques for sampling fish, benthos, and plankton, and to explore possibilities of managing both natural and artificial floodplain pools for fish and fish food production.

TID-3918 PC$13.60/MF$1.45
Ichthyological Associates, Ithaca, N.Y. (Usa).
HEATED EFFLUENTS AND EFFECTS ON AQUATIC LIFE WITH EMPHASIS ON FISHES. A BIBLIOGRAPHY. BULLETIN NO. 9.
E. C. Raney, B. W. Menzel, and E. C. Weller. 1973, 651p

Descriptors: (*Thermal effluents, *Bibliographies), (*Fishes, Bibliographies), (*Aquatic ecosystems, *Thermal pollution), Animals, Biological effects, Plants, Water.

For abstract, see NSA 29 07, number 15668.

TT-71-53131 PC$21.75/MF$1.45
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
ECOLOGY OF WATERFOWL OF LATVIA,
H. A. Mihelsons, and J. A. Viksne. 1974, 374p Trans. of mono. Ekologiya Vodoplavaushchikh Ptits Latvii, Riga, 1968, by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Birds, *Latvia, *Ecology, Wildlife, Bird diseases, Parasitic diseases, Helminthic diseases, Animal physiology, Animal migrations, USSR, Translations.
Identifiers: *Waterfowls.

The geographical distribution and nesting habits of waterfowls are discussed. A summary of helminthic diseases of birds by classification is presented.

6G. Escape, Rescue, and Survival

PB-229 998/0GA PC$4.50/MF$1.45
Transportation Systems Center, Cambridge, Mass.
PROGRAM PLAN FOR SEARCH AND RESCUE ELECTRONICS ALERTING AND LOCATING SYSTEM.
Final rept. Jan-Jun 73,
C. Mundo, L. Tami, and G. Larson. Feb 74, 102p DOT-TSC-OST-73-42

Descriptors: *Search and rescue, *Warning systems, *Position finding, Global communication, Distress signals, Communication satellites, Navigation satellites, Radio relay systems.
Identifiers: GRAN(Global Rescue Alarm Network), DILS(Distress Incident Locator System), Global rescue alarm network, Distress incident locator system.

The study investigates the requirements that exist for electronic devices for alerting and locating distress incidents and presents a plan for acquiring an adequate capability. Data are provided that bound the problem. Possible alternatives are examined and compared. As a result, the GRAN-DILS concept is selected upon the basis of cost/benefits. A plan for acquiring the GRAN-DILS system is provided. Recommendations are made for the interim period prior to GRAN-DILS availability.

6H. Food

AD-776 336/0GA PC$3.00/MF$1.45
Army Natick Labs Mass Food Lab
EFFECTS OF CONDENSED PHOSPHATES ON THE PH, WATER-HOLDING CAPACITY AND MEAT SWELLING PROPERTIES OF PORK MUSCLE.
Technical rept.,
G. W. Shults, and E. Wierbicki. Jan 74, 24p Rept no. FL-179 USA-NLABS-TR-74-22-FL

Descriptors: *Pork, *Phosphates, Food, Military rations, pH factor, Shrinkage.

Sodium salts of pyrophosphate (PP), tripolyphospate (TPP), hexametaphosphate (HMP), metaphosphate (MP) and four commercial blends of phosphates (Kena, Foodfos, Curafos 22-4 and Curafos 11-2) were investigated for their effects on water holding and swelling of Longissimus and Semimembranosus pork muscles. The phosphate addition varied from 0.25 to 1.0% in the meat. Combined effects with salt (0.5 to 1.5% NaCl) were also investigated. The greatest reduction in the loss of natural juices during heating at 70C (water-holding capacity) and the greatest increase in the swelling (with and without NaCl additions) were achieved by adding PP, TPP, and Curafos 11-2; followed by Curafos 22-4 and Kena; with practically no effect by Foodfos, MP and HMP. (Author)

AD-776 357/6GA PC$3.00/MF$1.45
Army Natick Labs Mass Food Lab
EFFECT OF FREEZE-THAW CYCLE ON MEAL, READY-TO-EAT, INDIVIDUAL, 1966 PROTOTYPE.
Final technical rept.,
Jessie W. McNutt, and Frances H. Lee. Feb 74, 20p Rept no. FL-183 USA-NLABS-TR-74-24-FL

Descriptors: *Freeze dried foods, *Freezing, *Thawing, Cycles, Military rations, Acceptability, Quality.

The effect of freezing and thawing on the 1966 Prototype of the Meal, Ready-to-Eat, Individual, was studied to determine if there were changes in 39 food items in the ration. Using six controlled freezing and thawing cycles, it was found that there was little change in ratings due to freezing and thawing when compared to control samples stored at 40F. (4C.). A decline in quality of chicken a la king was noted after second cycle and after fourth cycle in beef stew. (Author)

COM-74-10715/2GA PC$3.75/MF$1.45
Texas A and M Univ., College Station. Dept. of Animal Science.
ROLE OF MICROORGANISMS IN SHRIMP QUALITY: A RESEARCH SUMMARY,
C. Vanderzant, B. F. Cobb, and R. Nickelson. Jan 74, 52p* TAMU-SG-74-201 NOAA-74022601 Grant NOAA-043-158-18

Descriptors: *Shrimps, *Food deterioration, *Food storage, Aquaculture, Seafood, Shelf life, Frozen foods, Quality control, Bacteria, Crustacea, Texas, Experimental data.
Identifiers: Sea Grant program, Vibrio parahaemolyticus, Gulf Coast Region(United States).

An evaluation of the major microbiological problems related to the production and processing of shrimp indicated that a critical need for information existed in four specific areas. These areas were identified as follows: Role of microorganisms in the quality deterioration of Gulf Coast and pond-reared shrimp; development of indicator test to determine the potential shelf life of shrimp; role of vibrio parahaemolyticus in Gulf Coast seafoods; and quality deterioration of microbial origin in frozen breaded raw shrimp. A justification of these research objectives, summary of previous work, and major research accomplishments for the period 1969-1972 are presented.

COM-74-50189-02-02/GA
(Order as COM-74-50189-02)
National Marine Fisheries Service, College Park, Md. College Park Fishery Products Technology Lab.
CHEMICAL AND NUTRITIVE VALUES OF SEVERAL FRESH AND CANNED FINFISH, CRUSTACEANS, AND MOLLUSKS. PART II. FATTY ACID COMPOSITION,
James C. Bonnet, Virginia D. Sidwell, and Elizabeth G. Zook. 1974, 8p NOAA-74030603-2, MFR-Paper-1033
Included in Marine Fisheries Review, v36 n2 p8-14 Feb 74, COM-74-50189-02.

Descriptors: *Fishes, *Seafood, *Food processing, Fatty acids, Nutrition, Salmon, Tunas, Mollusca, Crustacea, Cod, Vegetable oils, Food.

Data are presented on total fat and fatty acid composition of 32 commonly eaten finfish, crustaceans, and mollusks. Among these are two canned finfish, salmon, tuna in oil and tuna in brine; the other samples were raw. All 13 species of the fresh finfish fall into the low fat classification, ranging from the low of 0.35% in the Icelandic cod to a high of 4.86% in the halibut. The tuna, canned in vegetable oil, contained the highest level of total fat. The one canned in brine was markedly lower. The canned salmon was the only finfish that falls in the category of high fat fish. The mollusks and crustaceans have low total fat contents.

COM-74-50189-02-03/GA
(Order as COM-74-50189-02)
National Marine Fisheries Service, College Park, Md. College Park Fishery Products Technology Lab.
USING ENZYMES TO MAKE FISH PROTEIN CONCENTRATES,
Malcolm B. Hale. 1974, 5p NOAA-74030603-3, MFR-Paper-1034
Included in Marine Fisheries Review, v36 n2 p15-18 Feb 74, COM-74-50189-02.

Descriptors: *Fish protein concentrates, Enzymes, Proteins, Amino acids, Lipids, Fishing products.
Identifiers: *Urophycis chuss.

Fish protein concentrates having desirable functional properties can be prepared by using selected enzymes to solubilize protein and release lipids. An enzymatic FPC process could make profitable use of some of our underutilized or latent resources. The relative activities of 23 commercially available proteolytic enzyme preparations acting on a fish protein substrate were measured. Pancreatin, pepsin, and papain had highest activity per unit cost of enzyme. Soluble hydrolysates were prepared from red hake (Urophycis chuss) using a variety of enzyme and digestion conditions. (Modified author abstract)

COM-74-50189-02-07/GA
(Order as COM-74-50189-02)
National Marine Fisheries Service, Gloucester, Mass. Atlantic Fishery Products Technology Center.
EFFECT OF DRAINING METHOD ON THE QUALITY OF FISH STORED IN BOXES,
John A. Peters, Allan F. Bezanson, and John H. Green. 1974, 4p NOAA-74030603-7, MFR-1038
Included in Marine Fisheries Review, v36 n2 p33-35 Feb 74, COM-74-50189-02.

Descriptors: *Marine fishes, *Food storage, Food packaging, Taste, Contamination, Quality, Microbiology.

To determine if specially constructed fish boxes which drain the meltwater to the outside of the box are required to protect the fish in the lower layers from contamination by drainage from the upper layers are necessary for successful boxing at sea, trails were conducted in the center using readily available plastic tote boxes. Results of taste panel and microbiological tests on haddock stored with ice in these boxes showed no significant difference in quality between fish from the upper and from the lower boxes. Therefore, fish can be boxed at sea using inexpensive containers rather than expensive, specially constructed fish boxes. (Author)

LA-5460-PR PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
HIGH-SPEED PHYSICAL METHODS FOR DETECTING TRICHINELLAE IN MEAT. ANNUAL REPORT, JULY 1, 1972--JUNE 30, 1973.
D. M. Holm, P. M. Giles, and J. D. Seagrave. Nov 73, 6p
Contract W-7405-eng-36

Descriptors: (*Trichinella, *Monitoring), Diagnosis, Larvae, Meat, Trichinosis.

For abstract, see NSA 29 07, number 17982.

PAT-APPL-297 123 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PROCESS FOR PREPARING CARROT JUICE.
Patent Application,
Thomas S. Stephens, Guadalupe Saldana, and Harold E. Brown. Filed 12 Oct 72, 13p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Food processing, *Carrots, *Liquids, *Patent applications.
Identifiers: PAT-CL-99-100.

The invention relates to a novel process for preparing carrot juice in such a manner as as to avoid the formation of a congulum upon further processing. A revised pretreatment procedure is employed; which permits the extraction of juice by conventional methods and yields a juice in which suspended solids are homogeneously distributed. This pretreatment consists of submerging whole washed carrots in a solution of a food grade acid at boiling temperature and cooking for about five minutes. Coagulum will not form when the juice is further subjected to the conventional pasteurization and canning temperatures used for vegetable juice preservation.

PAT-APPL-348 840 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
METHOD FOR IMPROVING THE SHELF LIFE OF ROASTED PEANUTS.
Patent Application,
Joseph Pominski, Henry M. Pearce, Jr., James J. Spadaro, and Henry L. E. Vix. Filed 6 Apr 73, 9p

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Food processing, *Peanuts, *Patent applications.
Identifiers: PAT-CL-99-126.

The patent application relates to a method of improving the shelf life and the quality of peanuts that have been partially defatted by pressing, reconstituted by the addition of moisture and subsequently roasted. The method is based upon the discovery that the diffusion of gases (specifically oxygen and nitrogen) into the interstitial spaces of the defatted, reconstituted and roasted peanut tissues is a relatively slow process. The method involves the replacement with nitrogen gas of a portion of the oxygen containing air within the peanut tissue interstitial areas. The nuts are subsequently moisture reconstituted (expanded) and roasted.

PB-229 856/0GA PC$11.00/MF$1.45
Tracor-Jitco, Inc., Rockville, Md.
SCIENTIFIC LITERATURE REVIEWS ON GENERALLY RECOGNIZED AS SAFE (GRAS) FOOD INGREDIENTS-GLUTAMATES.
Final rept. 1920-73.
Feb 74, 592p* FDABF-GRAS-184
Contract FDA-72-100
Supersedes report no. PB-223 867.

Descriptors: *Glutamates, *Food additives, Toxicology, Nutrition, Biochemistry, Chemistry, Food consumption, Reviews, Public health, Bibliographies.
Identifiers: Generally recognized as safe food ingredients, *GRAS food ingredients.

The Scientific Literature Review summarizes the available scientific literature from 1920 to 1973 related to safety of glutamates as a food ingredients. Chemical information, biological data, and biochemical aspects of glutamates are given in a 590 page summary containing 8365 references.

PB-230 306/3GA PC$3.75/MF$1.45
Information, Inc., Rockville, Md.
SCIENTIFIC LITERATURE REVIEWS ON GENERALLY RECOGNIZED AS SAFE (GRAS) FOOD INGREDIENTS - PECTIN.
Final rept. 1920-1973.
Feb 74, 54p* TR-72-1552-43 FDABF-GRAS-206
Contract FDA-72-14

Descriptors: *Pectins, *Food additives, Toxicology, Bioassay, Laboratory animals, Biochemistry, Chemical properties, Bibliographies.
Identifiers: *GRAS food ingredients, Generally recognized as safe food ingredients.

The Scientific Literature Review summarizes the available scientific literature from 1920 to 1973 related to the safety of pectin as a food ingredient. Chemical information, biological data, and biochemical aspects of pectin are given in a 52 page summary containing 493 references.

6J. Industrial (Occupational) Medicine

AD-776 928/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE PROBLEM OF SKIN DISEASES IN WORKERS ENGAGED IN THE MACHINING OF CHROMIUM ALLOYED STEELS,
N. N. Bogomolets. 25 Mar 74, 8p Rept no. FTD-HT-23-1265-74
Edited trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) v14 n2 p54-55 Feb 70, by Charles T. Ostertag, Jr.

Descriptors: *Allergic diseases, *Occupational diseases, Skin diseases, Machining, Chromium alloys, Stainless steel, USSR, Translations, Prophylaxis.
Identifiers: *Contact dermatitis, Chromium steels, Eczema.

Eczemas which develop in workers who operate lathes and grinding machines for the machining of chromium alloyed steels with the use of a cooling emulsion are occupational and are conditioned by the sensitizing action of chromium, which is also confirmed by the development in them of increased sensitivity to chromium. For the prophylaxis of skin diseases it is necessary to incorporate the automation and mechanization of the cutting processes, and also the regular replacement of the working solutions of cooling liquids which are fed to the machines.

AD-776 943/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CHANGES IN HEARING OF WORKERS UNDER A PROLONGED EFFECT OF NOISE WITH STANDARD PARAMETERS,
L. I. Maksimiva. 26 Mar 74, 15p Rept no. FTD-HT-23-1036-74
Edited trans. from Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p92-99 1968, by Victor Mesenzeff.

Descriptors: *Hearing, *Noise, *Ear protectors, Deafness, Test methods, Audiometry, Stress(Physiology), Personnel, USSR, Translations, Occupational diseases, Medical research, Auditory acuity, Predictions.

For prolonged periods of time under industrial conditons, noise at 85-88 dB which is at the maximum permissilbe levels and 74-80 dB which is 5-10 dB below the maximum permissible levels in the frequency range of 800 to 4000 Hz, can present a danger with regard to the development of occupational hardness of hearing when the individual's hearing organ is not sufficiently stable. In order to improve the effective standards, in addition to physiological studies, it is necessary to carry out dynamic clinical observations in the process of chronic noise effect under industrial conditions.

COM-74-10477/9GA PC$3.25/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
EVALUATION OF COMMERCIAL INTEGRATING-TYPE NOISE EXPOSURE METERS,
Willian A. Leasure, Jr., Ronald L. Fisher, and Marilyn A. Cadoff. Dec 73, 35p NBSIR-73-417 EPA-550/9-73-007

Descriptors: *Sound level meters, *Dosimeters, Noise, Exposure, Evaluation, Monitors.
Identifiers: *Noise exposure meters.

As a result of the promulgation of occupational noise exposure regulations by the Federal government, there are a number of commercial noise exposurmeters on the market today that provide a measure of noise integrated (with appropriate weighting) over a time interval. This report presents the results of an evaluation of such instruments by the National Bureau of Standards as to their usefulness in monitoring compliance with occupational noise regulations as well as their applicability as instruments for use in achieving the broader goals of the EPA. Tests were designed and conducted to evaluate microphone and system response to sound of random incidence, frequency response, crest factor capability, accuracy of the exchange rate chrcuitry, performance of the nkase etposure meter as a function of temperature, and the dependence of the device on batteq vkjtage. The rathonale of the test pqncedures used to evaluate overall system as well as spechfic peq-

dormance attqibutes, details of the measurement technhues, and results obtained are discussed. (Author)

PB-229 233/2GA PC$4.50/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. CHEMETRON CHEMICAL, ORGANICS DIVISION, NEWPORT, TENNESSEE.
Final rept. Mar 72-Feb 73,
David J. Burton, and Edward Shmunes. Jun 73, 27p HHE-71-20-49, NIOSH-TR-049-74

Descriptors: *Hazardous materials, *Industrial medicine, *Chemical industry, *Chloromethanes, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Sulfanilic acid, Chlorides.
Identifiers: *Occupational Safety and Health Act of 1970, Sulfanilyl chloride/acetyl.

The National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees conducted a health hazard survey to evaluate exposure to n-acetyl sulfanilyl chloride (ASC) and methylene chloride (MDC) in the production of acetyl sulfanilyl chloride at Chemetron Corporation, Newport, Tennessee. From the results of medical and environmental studies it has been determined that there was a significant hazard to the health and well-being of workers involved in the production of acetyl sulfanilyl chloride. This conclusion is based upon evidence of irritant and immediate allergic reactions following exposure to ASC and airborne concentrations of MDC exceeding Federal Standards which are regarded as the current best estimate of safe exposure limits. Recommendations have been made to management to obviate the observed hazards to affected employees.

PB-229 235/7GA PC$4.75/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. CHEMTRON CHEMICAL, ORGANICS DIVISION, NEWPORT, TENNESSEE.
Final rept., Mar-Dec 72,
David J. Burton, and Edward Shmunes. Jun 73, 34p NIOSH-TR-050-74, HHE-71-9-50

Descriptors: *Hazardous materials, *Industrial medicine, *Benzene, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Feeding stuffs, Chemical industry, Physiological effects, Hazards.
Identifiers: *Occupational Safety and Health Act of 1970, *Diethystilbestrol, Aif sampling.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to determine exposure to benzene and diethylstilbestrol in the production of diethylstilbestrol at Chemetron Chemical, Organics Division, in Newport, Tennessee. Based upon the results of medical and environmental studies, it has been determined that there was a significant hazard to the health and well being of the workers from exposure to benzene and diethystilbestrol. Production of diethylstilbestrol was stopped at the company November 28, 1972 as the result of the Food and Drug administration order which prohibits the use of diethylstilbestrol in animal feeds.

PB-229 236/5GA PC$4.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. REYNOLDS METALS COMPANY, BAUXITE, ARKANSAS.
Final rept. Mar-Nov 72,
Henry Ramos, Jerome P. Flesch, and Steven K. Shama. Jul 73, 22p NIOSH-TR-047-74, HHE-71-13-47

Descriptors: *Hazardous materials, *Industrial medicine, *Aluminum oxide, *Bauxite, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Metal industry, Dust, Silicon dioxide, Fluoride, Quartz, Aluminum ores, Sintering.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) to evaluate exposure to various dusts in operations at the Reynolds Metals Company in Bauxite, Arkansas. Based upon the results of environmental and medical investigations, it was determined that bauxite dust, alumina dust, and sinter dust have toxic effects at the concentrations found during the evaluation, and that the substances, crystalline silica and fluoride, are not toxic at the concentrations measured. Engineering controls and personal medical protective measures have been recommended to management to control hazardous exposures.

PB-229 237/3GA PC$5.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. ELECTRONICS CORPORATION OF AMERICA, CAMBRIDGE, MASSACHUSETTS.
Final rept. Dec 72-Apr 73,
Robert Vandervort, and Phillip L. Polakoff. Jun 73, 37p NIOSH-TR-046-74, HHE-72-108-46

Descriptors: *Hazardous materials, *Industrial medicine, *Exhaust gases, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Carbon monoxide, Nitrogen oxide, Nitrogen dioxide, Gasoline engines, Diesel engines.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

In response to a request received from a representative of employees the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to diesel and gasoline engine exhaust gases emanating from an indoor loading dock at the Electronics Corporation of America, Cambridge, Massachusetts. A new local exhaust system was installed prior to the sampling survey. Carbon monoxide was monitored continuously during one workshift, and spot samples of oxides of nitrogen were obtained at spaced intervals. It was determined that engine exhaust gases (carbon monoxide, nitric oxide, and nitrogen dioxide) were not toxic at the concentrations found in this plant with the new ventilation system operating.

PB-229 504/6GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. FEDERAL SUPPLY SERVICES WAREHOUSES, BAYONNE, BELLE MEADE AND RARITAN, NEW JERSEY.
Final rept.,
Melvin T. Eddleston. Aug 73, 5p NIOSH-TR-063-74, HHE-73-17-63

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon monoxide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Lift trucks, Fork trucks, Materials handing equipment, Warehouses, Exhaust gases.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

The National Institute for Occupational Safety and Health (NIOSH) in response to a request received from an employer conducted a health hazard survey to evaluate exposure to carbon monoxide from gasoline-powered forklift trucks at the General Supply Service Warehouses at Raritan, Belle Meade, and Bayonne, New Jersey. It was determined that the carbon monoxide fumes were not toxic at the concentrations found at the time of this evaluation. The determination was based on environamental levels of carbon monoxide funes and employee interviews.

PB-229 505/3GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. RINGSBY UNITED FREIGHT LINE, LOS ANGELES, CALIFORNIA.
Final rept.,
Jeff Burton. Aug 73, 5p NIOSH-TR-062-74, HHE-73-16-62

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon monoxide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Lift trucks, Materials handling equipment, Fork trucks, Exhaust gases.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

A health hazard survey was conducted by the National Institute for Occaptional Safety and Health (NIOSH) to evaluate exposure to carbon monoxide from forklift trucks at the Ringsby United Freight Line in Los Angeles, California. It was determined that no hazard from carbon monoxide existed under conditions observed at the time of this evaluation. This determination was based upon low atmospheric levels of carbon monoxide, no employee complaints, lack of symptoms, and no past history of intoxication among employees.

PB-229 506/1GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. REDMOND FINISHING COMPANY, EAST STROUDSBURG, PENNSYLVANIA.
Final rept. Dec 72-Apr 73,
Steven R. Cohen, and Albert A. Maier. Aug 73, 8p NIOSH-TR-061-74, HHE-72-75-61

Descriptors: *Hazardous materials, *Industrial medicine, *Textile processes, *Polyacrylates, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Dust, Spraying, Batts, Acidity, Acrylic resins, Emulsions.
Identifiers: *Occupational Safety and Health Act of 1970, Ethyl acrylates.

In response to a request received from a representative of employees the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to the dust of an acrylic emulsion polymer in use in the Batting Department of the Redmond Finishing Company in East Stroudsburg, Pennsylvania. It has been determined that the level of dust (ethyl acrylate polymer) measured at this facility is potentially toxic. This determination was based upon a laboratory characterization of the dust by pH and size of the particulate, environmental sampling during normal operating conditions and medical interviews with the workers. Recommendations have been suggested to management to diminish the potential hazard of dust exposure to 10-12 affected employees.

PB-229 507/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WEHMEIER REPRODUCTION SERVICE, CINCINNATI, OHIO.
Final rept.,
Robert E. Rosensteel, and Phillip Polakaff. Apr 73, 17p NIOSH-TR-039-74, HHE-72-104-39

Descriptors: *Hazardous materials, *Industrial medicine, *Blueprinting, *Ozone, *Ammonia, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Reproduction(Copying).
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposures to ammonia and ozone during the operation of a blueprint machine at the Wehmeier Reproduction Service, Cincinnati, Ohio. It was determined that ammonia and ozone are not toxic at the concentrations measured in the work environment at the time of this survey. Recommendations have been suggested to management to obviate potential hazards to the two affected employees.

PB-229 508/7GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. GATES RUBBER COMPANY, DENVER, COLORADO.
Final rept. Nov 72-Feb 73,
Bobby J. Gunter, and James B. Lucas. Apr 73, 17p NIOSH-TR-038-74, HHE-72-86-38

Descriptors: *Hazardous materials, *Industrial medicine, *Rubber industry, Diisocyanates, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Hoses, Styrene, Toluene, Formaldahyde, Butadiene, Resorcinol, Pyridines, Chlovoethanes, Vinyl compounds.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, Pyridine/vinyl, Ethane/trichloro, Isocyanic acid/methylphenleneester.

The National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees conducted a health hazard survey to evaluate the potential hazards associated with the use of chemicals in the braided hose department of the Gates Rubber Company, Denver, Colorado. It was determined that the following chemicals were not toxic at the concentration found at the time of the environmental surveys: styrene, toluene, toluene-2,4-diisocyanate, vinyl pyridine, formaldehye, butadiene, methyl chloroform, and resorcinol. Recommendations have been suggested to management to obviate the potential hazards to approximately 70 affected employees.

PB-229 514/5GA PC$4.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. MOBIL OIL CORPORATION, AUGUSTA, KANSAS.
Final rept.,
Raymond L. Hervin, Ray Rivera, and Jerome P. Flesch. Apr 73, 21p NIOSH-TR-037-74, HHE-72-91-37

Descriptors: *Hazardous materials, *Industrial medicine, *Asbestos, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Oil refineries, Insulation, Heat stress, Protective clothing.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) to evaluate exposures to asbestos dust and to hot environments relevant to the company's requirement for insulators' wearing of special clothing (paper overalls) while working with asbestos at the Mobil Oil Corporation's Refinery in Augusta, Kansas. It was determined that asbestos is not toxic at the concentrations used and found in the insulators' working operations at the time of the survey. It was also determined that the wearing of the semiporous coveralls over the personal clothing of the insulators does contribute to the potential heat stress problem. Recommendations consistent with the rules and regulations set forth by the U.S. Department of Labor and good industrial hygiene practices have been made to management to obviate any potential hazards from the exposure of the four employees to asbestos and hot environments.

PB-229 600/2GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. SUPERIOR METALS PRODUCTS, INC., LIMA, OHIO.
Final rept.,
Robert Vandervort. Sep 73, 5p NIOSH-TR-065-74, HHE-73-3-65

Descriptors: *Hazardous materials, *Industrial medicine, *Kerosene, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Metal industry, Vapors.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) to evaluate exposure to kerosine in use in the Aluminum Department of the Superior Metals Products, Inc. in Lima, Ohio. It was determined that the vapors from kerosine are nottoxic at the concentrations measured during this evaluation. The determination was based on environmental levels of kerosine vapor, analysis of the kerosine, and employee interviews.

PB-229 601/0GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. GATES RUBBER CO., BRAIDED HOSE DIVISION, DENVER, COLORADO.
Final rept. May-Jul 73,
Bobby J. Gunter. Aug 73, 5p NIOSH-TR-064-74, HHE-73-48-64

Descriptors: *Hazardous materials, *Industrial medicine, *Lead poisoning, *Rubber industry, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Hoses, Elastomers, Blood analysis.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

The National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees conducted a health hazard survey to evaluate potential hazards associated with exposure to lead during the manufacture of braided hose at the Gates Rubber Company, Denver, Colorado. Based on results of environmental-medical studies, it has been determined that the exposure to lead at the Gates Rubber Company is not in concentrations that are toxic to the workers.

PB-229 602/8GA PC$4.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. ROBIN PRODUCTS COMPANY, WARREN, MICHIGAN.
Final rept. Apr-May 73,
Robert E. Rosensteel, and Phillip L. Polakoff. Sep 73, 23p NIOSH-TR-066-74, HHE-73-1-66

Descriptors: *Hazardous materials, *Industrial medicine, *Plastics processing, *Formaldehyde, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Acoustic measurement, Injection molding, Vapors.
Identifiers: Occupational Safety and Health Act of 1970, Air sampling.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to formaldehyde vapors in the injection molding area of the Robin Products Company, Warren Michigan. It was determined that toxic exposure to formaldehyde does not exist at the concentrations found in this work environment. This determination is based upon medical histories, physical examinations of workers, and environmental measurements of formaldehyde concentrations.

PB-229 603/6GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. TRANS-WORLD AIRLINES, INC., OVERHAUL BASE, KANSAS CITY, MISSOURI.
Final rept. Aug-Nov 72,
Raymond L. Hervin, and Ruth Reifschneider. Sep 73, 9p NIOSH-TR-067-74, HHE-72-60-67

Descriptors: *Hazardous materials, *Industrial medicine, *Waste treatment, Acrylic resins, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Sulfuric acid, Calcium hydroxide, Chlorine, Sodium hydroxide, Fullers earth, Dust, Iron sulfate.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

The National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees conducted a health hazard survey to evaluate exposure to various chemicals used in the Waste Treatment Plant of Trans-World Airlines, Kansas City, Missouri. Based on environmental-medical studies, it has been determined that sulfuric acid, chlorine, sodium hydroxide, iron salts, calcium hydroxide, fuller's earth, respirable dust, and total dust are not toxic at the concentrations found during normal operations at the waste treatment plant. It has been further determined that concentrated solutions or gases are potentially toxic and may result in acute exposures to employees during improper maintenance operations, and accidental leaks. Recommendations have been made to obviate potential hazards to 12 affected employees.

PB-229 604/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. N. L. INDUSTRIES, INC., TITANIUM PIGMENT DIVISION, ST. LOUIS, MISSOURI.
Final rept. Oct 72-May 73,
Raymond L. Hervin, and James B. Lucas. Sep 73, 13p NIOSH-TR-068-74, HHE-72-88-68

Descriptors: *Hazardous materials, *Industrial medicine, *Titanium dioxide, Toxicity, Critera, Inspection, Standards, Recommendations, Industrial hygiene, Contact dermatitis, Dust, Hazards, Alcohols, Amines, Pigments.
Identifiers: *Occupational Safety and Health Act of 1970, Ethanol/nitrilo-tri, *Propanol/amino, Isopropyl alcohols.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) to evaluate hazards associated with the use of monoisopropanolamine and titanium dioxide in the milling department of N. L. Industries, Inc., in St. Louis, Missouri. Based upon medical evaluation, it has been determined that monoisopropanolamine was toxic and represented a definite cutaneous hazard upon direct contact with the skin. Its usage and use of triethanolamine which was substituted for it were both discontinued during the survey period. Based upon the medical-environmental study, it was determined that a toxic condition to workers from exposure to titanium dioxide dust does not exist at concentrations found in this work environment.

PB-229 606/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. VAIL ENTERPRISES, LAVETA, COLORADO.
Final rept.,
Bobby J. Gunter, and Arthur Bodner. Sep 73, 6p
NIOSH-TR-069-74, HHE-73-85-69

Descriptors: *Hazardous materials, *Industrial medicine, *Diisocyanates, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Woodworking, Fences, Adhesives.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, Isocyanic acid/(methylphenylene-ester)-di.

In response to a request received from an employer, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate potential hazards associated with exposure to isocyanate during the manufacture of wood fences at Vail Enterprises, LaVeta, Colorado. Based on the environmental-medical evaluation of work performed in an outside shed with natural ventilation, it has been determined that the exposure to toluene-2,4-diisocyanate and methylene di-(4-phenylisocyanate) is not in concentrations that are toxic to workers at Vail Enterprises. Prior to this evaluation, work had been performed in confined, non-ventilated areas. Under these conditions workers became sensitized to isocyanate.

PB-229 708/3GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. EMERSON ELECTRIC COMPANY, PARIS, TENNESSEE.
Final rept. Jan-Feb 73,
Henry Ramos, and James B. Lucas. Mar 73, 12p
NIOSH-TR-032-74, HHE-72-85-32

Descriptors: *Hazardous materials, *Industrial medicine, *Cutting fluids, *Coolants, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Contact dermatitis, Machining, Metal working, Folliculitis, Skin diseases.
Identifiers: *Occupational Safety and Health Act of 1970.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to determine exposures to various types of cutting and coolant oils used at Emerson Electric Company, Paris, Tennessee. As a result of this investigation eleven cases of dermatitis were found in forty-one individuals examined. A history of similar problems was obtained from ten other employees. Both oil folliculitis and primary irritant dermatitis were encountered and shown to be related respectively in the use of Gulf D-11 insoluble cutting oil and Lowlub SS40 synthetic soluble coolant. Recommendations have been suggested to management to obviate observed toxic hazards to 50 affected employees.

PB-229 709/1GA PC$4.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. SEATTLE, WASHINGTON.
Final rept. Aug 72-Jan 73,
Phillip L. Polakoff, and Robert Vandervort. Sep 73, 23p NIOSH-TR-070-74, HHE-72-53-70
Also includes Rept. nos. HHE-72-54-71 thru HHE-72-58-75.

Descriptors: *Hazardous materials, *Industrial medicine, *Polyvinyl chloride, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Pyrolysis, Packaging, Hazards, Respiratory diseases, Air pollution.
Identifiers: *Occupational Safety and Health Act of 1970.

In rsponse to a received from a representative of employees the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to thermal decomposition products a polyvinyl chloride (PVC) meat packaging film at six retail grocery companies in the Seattle, Washington area. Based on medical evidence compiled during this limited study of meat wrapping employees it was determined that air contaminants generated by the thermal cutting of polyvinyl chloride packaging films in conjunction with the wrapping of meat are potentially toxic to meat wrapping employees. Symptoms range from mild eye, nose and throat irritation to more serious respiratory problems for meat wrappers who have an underlying predisposition to respiratory difficulties. Recommendations have been suggested to management regarding pre-employment examinations and work practices.

PB-230 147/1GA PC$8.00/MF$1.45
Department of Labor, Washington, D.C. Library.
OCCUPATIONAL SAFETY AND HEALTH. A BIBLIOGRAPHY.
Final rept.
1974, 370p* DLOSHAT-74-0001

Descriptors: *Bibliographies, *Industrial medicine, *Occupational diseases, Humans, Safety, Hazards, Toxicity, Industrial hygiene, Standards, Injuries.
Identifiers: *Occupational safety and health.

The publication consists of an annotated bibliography of published sources treating occupational safety and health both generally and specifically. The literature included deals primarily with causes, and possible prevention, of occupational injury and disease, thus indicating the thrust, in its compilation, toward providing information contributory to the total understanding of prevention illnesses and injuries, and eliminating potential hazards in American occupational activity. References listed comprise essentially English-language books and pamphlets published since 1950, and articles from periodicals published since 1970. To afford maximum ease of utilization, subjects are classified in keeping with topical treatment of the occupational safety and health standards.

PB-230 193/5GA PC$4.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. UNIROYAL INCORPORATED, MISHAWAKA, INDIANA.
Final rept. Mar-Jun 72,
George J. Butler, and James S. Taylor. Feb 73, 23p
NIOSH-TR-027-74, HHE-72-13-27

Descriptors: *Hazardous materials, *Industrial medicine, *Rubber industry, Hexane, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Benzene, Solvents, Foam rubber, Acetone, Xylene, Toluene, Methyl ethyl ketone, Contact dermatitis, Latex.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

In response to a request received from a representative of employees the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate potential health hazards associated with toxic substances used at the Uniroyal Corporation rubber plant located at Mishawaka, Indiana. Potentially toxic substances which were considered in this evaluation were: toluene-2,4-diisocyanate (TDI) in the urethane foam area for production of automobile seat cushions; amines in the wet latex foam area; rubber compounding chemicals in the Banbury mixing area; and solvents and resorcinol used for mixing industrial cements in the cement room. It was determined that exposures to TDI and the solvents sampled are not considered to be potentially hazardous.

6K. Life Support

AD-776 348/5GA PC$5.75/MF$1.45
Army Aeromedical Research Lab Fort Rucker Ala
PRELIMINARY EVALUATION OF PORTABLE AVIATION OXYGEN SYSTEMS,
Jay C. Bisgard, Roderick J. McNeil, and Frank S. Pettyjohn. Jul 73, 51p Rept no. USAARL-73-16

Descriptors: *Portable equipment, Oxygen, Medical evacuation, Rescue equipment, High altitude.
Identifiers: *Oxygen supply equipment.

The object was to determine the requirements for portable aviation oxygen systems during Army high altitude rescue and medical evacuation missions, and then to determine the necessity for R and D efforts by evaluating the potential of currently available system components to fulfill the identified requirements. This preliminary report is a record of USAARL's involvement in the area of Army aviation oxygen systems to include researching the background to achieve a proper direction for study, selection of promising systems for altitude chamber evaluation, study results, conclusions, and feasible recommendations. It was found that immediate Army requirements can be satisfied by currently available military and commercial oxygen system components. (Modified author abstract)

AD-776 384/0GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
OXYGEN BREATHING EQUIPMENT FOR HIGH ALTITUDE OPERATIONS.
Final rept. 8 Nov 71-2 Oct 72,
Frederick M. Drake. Jan 74, 15p Rept no. LWL-74-06

Descriptors: *Oxygen equipment, *Breathing apparatus, *High altitude, Life support, Rescues, Performance(Engineering).

The US Army Land Warfare Laboratory (USALWL) initiated a program to develop and provide oxygen breathing equipment for high altitude rescue operations in Alaska. Commercial eequipment currently used by civilian mountain climbing teams was investigated nd the Robertshaw Controls Company oxygen system was selected and modified to meet the US Army requirements. The results of the evaluation were favorable, although comments from participating units indicated a lighter weight system was desirable. From the medical viewpoint, additional modifications would be required for oxygen delivery to an injured rescue. (Modified author abstract)

N74-16843/6GA PC$10.00/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
DESIGN DEVELOPMENT AND TEST: TWO-GAS ATMOSPHERE CONTROL SUBSYSTEM.
Final Report.
J. K. Jackson. 1 Feb 74, 139p NASA-CR-134190, MDC-G4971
Contract NAS9-12924

Descriptors: *Cabin atmospheres, *Environmental control, *Space shuttle orbiters, *Spacecraft, Carbon dioxide, Hydrogen, Mass spectrometers, Nitrogen, Oxygen, Partial pressure, Water vapor.

For abstract, see STAR 1208

6L. Medical and Hospital Equipment

AD-776 319/6GA PC$3.00/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
EVALUATION OF INTRATRACHEAL CUFFS FOR AEROMEDICAL EVACUATION.
Final rept. Sep-Dec 73,

David L. Stoner, and Julian P. Cooke. Dec 73, 13p Rept no. SAM-TR-73-50

Descriptors: *Trachea, *Aeromedical evacuation, *Medical equipment, Decompression, Pressure, Altitude.
Identifiers: *Intratracheal cuffs.

Conventional, low-residual-volume intratracheal cuffs exert possible trachea damaging pressures at ground level and definitely damaging pressures upon ascent to 8,000 ft. Also, these cuffs exert excessively high pressures with decompression to 35,000 ft. Cuff/tracheal pressure exerted by a foam-type cuff was relatively unaffected by altitude changes, but depended on critical selection of the proper size tube. In contrast, several types of low-pressure, large-residual-volume cuffs with a control balloon maintained a satisfactory cuff/tracheal pressure at all altitudes. (Author)

AD-776 353/5GA PC$3.25/MF$1.45
Army Aeromedical Research Lab Fort Rucker Ala
SOFT (HYDROPHILIC) CONTACT LENSES IN U.S. ARMY AVIATION: AN INVESTIGATIVE STUDY OF THE BAUSCH AND LOMB SOFLENS (TRADE MARK),
John K. Crosley, Erwin G. Braun, and Robert W. Bailey. Mar 74, 26p Rept no. USAARL-74-10

Descriptors: *Eyeglasses, *Optical lenses, Aviation medicine, Visual acuity, Vision, Ophthalmology.
Identifiers: *Contact lenses.

The use of standard acrylic or 'hard' contact lenses has been relatively unsuccessful in the military aviation environment, particularly when worn by personnel flying rotary wing aircraft. The purpose of this study was to evaluate the applicability of one type of hydrophilic lens to U.S. Army aviation. Nineteen volunteer helicopter pilots served as subjects and three specific areas were investigated. These were: clinical procedures, foreign body involvement, and the effect of extended (72 hours) continuous wear. The results indicate that the Soflens offers certain advantages over acrylic lenses for this specialized application. There were, however, distinct problems encountered which may be lessened with the introduction of new lens materials and asepticizing techniques. (Author)

AD-776 630/6GA PC$4.00/MF$1.45
National Academy of Sciences-National Research Council Washington D C Comm on Hearing Bioacoustics Biomechanics
RESEARCH FACILITIES IN AUDITION WITHIN THE ARMED FORCES,
Russell Sergeant, Robert T. Camp, James Mosko, Charles Nixon, and Brian Walden. Mar 74, 13p
Contract N00014-67-A-0244-0021
Report of Subgroup 3, Subcommittee 6.

Descriptors: *Bioacoustics, *Research facilities, *Otorhinolaryngology, Military facilities, Hearing, Psychoacoustics.

The report presents descriptive information about the auditory research facilities at a number of military laboratories. The information is designed to enable researchers in audition at the various laboratories to become aware of existing auditory research capabilities within the branch services and to stimulate the cross-utilization of specialized or unique research capabilities. As the auditory research capabilities within the three services change, updated reports of a similar nature will be prepared. (Author)

N74-16848/2GA PC$7.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DEVELOPMENT AND FABRICATION OF HEAT-STERILIZABLE INHALATION THERAPY EQUIPMENT.
A. S. Irons. 15 Jan 74, 76p NASA-CR-136832, JPL-TM-33-670
Contract NAS7-100

Descriptors: *Heat treatment, *Refractory materials, *Respirators, *Sterilization, Bioinstrumentation, Breathing apparatus, Production engineering, Therapy, Thermal resistance.

For abstract, see STAR 1208

N74-16841/0GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
AN IMPROVED MECHANICAL PLETHYSMOGRAPH FOR THE HAND AND DISTAL FOREARM.
S. Figar. Jan 74, 8p NASA-TT-F-15234
Contract NASW-2483
Tran-Transl. Into English from Physiol. Bohemoslov., (Czechslovakia), V. 8, 1959 p 75-78.

Descriptors: *Arm (Anatomy), *Hand (Anatomy), *Mechanical devices, *Plethysmography, *Pneumography, Bioengineering, Body volume (Biology), Pressure recorders, Test equipment.

For abstract, see STAR 1208

N74-16842/8GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
A SIMPLE DEVICE FOR COLLECTING BLOOD SAMPLES FROM SUBJECTS UNDERGOING ACCELERATION IN A CENTRIFUGE.
F. Rossangio. Feb 74, 6p NASA-TT-F-15387
Contract NASW-2485
Tran-Transl. Into English from Riv. Med. Aeronaut. Spaz., (Italy) V. 28, Jan. - Mar. 1965 p 77-81.

Descriptors: *Blood vessels, *Cathetometers, *Centrifuging stress, *Human body, Aerospace medicine, Circulatory system, Intravenous procedures, Medical equipment, Samplers.

For abstract, see STAR 1208

PAT-APPL-326 145 PC$3.00/MF$1.45
Department of Health, Education, and Welfare, Washington, D.C.
DIALYZER CARTRIDGE.
Patent Application,
William W. Cooper, IV. Filed 23 Jan 73, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, Dialyzers.
Identifiers: *Dialyzer cartridges.

The patent application gives the design and specifications for a dialyzer cartridge. Drawings are presented.

PATENT-3 728 256 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
CROSSFLOW CAPILLARY DIALYZER.
Patent,
William W. Cooper, IV. Filed 22 Jun 71, patented 17 Apr 73, 7p PAT-APPL-155 471,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Dialyzers, Membranes, Dialysis, Body fluids, Blood.
Identifiers: *Hemodialyzers, PAT-CL-210-22.

The invention is a crossflow capillary dialyzer particularly useful for the dialyzation of body fluids, such as blood. It is characterized by a simple and economic design which promotes the velocity of dialyzate as it flows perpendicular to the capillary fibers in the dialyzer. The dialyzer comprises a plurality of generally parallel capillary semipermeable membrane fibers enclosed at both ends in potted headers within a shell. A system of baffles is employed within the dialyzer shell, which provide a tortuous or zig-zag flow path for the dialyzate as it crossflows over the capillaries.

PATENT-3 785 832 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
DENTAL PRIMER VARNISH.
Patent,
Rafael L. Bowen. Filed 13 Oct 71, patented 15 Jan 74, 4p PAT-APP'-189 034,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Dental materials, *Primers(Coatings), Shelf life, Chelating agents, Epichlorohydrin, Varnishes, Glycine, Chemical reactions, Adhesive bonding, Molecular structure, Epoxy compounds, Ethers.
Identifiers: PAT-CL-106-35.

The present invention relates to coupling agents which may be applied as primers or varnishes to dental substrate surfaces and which mediate improved adhesive bonding to resin-containing materials, such as composite dental filling materials. This invention specially contemplates the use of chelate-forming adducts (addition-reaction products) in which N-phenylglycine or derivatives thereof, are reacted with each glycidyl ether where the reaction sites are the N-H group of the amino acid and each reactive epoxy group.

PB-229 332/2GA PC$3.25/MF$1.45
Hospital for Sick Children, Toronto (Ontario). Research Inst.
THERMODYNAMIC APPROACH TO DEVELOPMENT AND TESTING OF NON THROMBOGENIC MATERIALS: ADHESION OF PLATELETS TO SYNTHETIC MATERIALS.
Annual rept. 27 Nov 72-26 Nov 73,
A. W. Neumann, C. A. Ward, and W. Zingg. Jan 74, 26p NIH/NHLI-73-2911-1
Contract PHS-73-2911

Descriptors: *Platelets, Adhesion, Blood coagulation, Surface properties, Interfacial tension, Thermodynamic properties, Synthetic fibers, Thin films, Anthracene, Chlorobenzenes, Canada.
Identifiers: *Biomaterials, *Blood compatible materials, Benzene/hexachloro, Xylenol hexachloro, Acetic acid/(Cholesteryl-ester), Hexatriacontane.

The author's hypothesis is that platelet adhesion proceeds in three steps: Contact between platelet and surface - governed by physical laws of diffusion and turbulence; platelet attachment - the problem under investigation; platelet adhesion - change of shape and release reaction, requiring metabolic energy. The work of attachment of a platelet was calculated based on the interfacial free energies involved in the system. Preliminary results obtained with five test materials show that over the range of surface tension of the solid material from 16 to 34 ergs/sq cm there were only small changes in the calculated work of attachment and no significant differences between the number of platelets adhering to the five test surfaces, in agreement with thermodynamic predictions. For the study of platelet adhesion to planar surfaces a new flow cell was constructed in which the fluid has reached a state of fully developed flow by the time it contacts the test surfaces. Thus, the effect of fluid dynamics on platelet adhesion is minimized.

PB-229 823/0GA PC$3.75/MF$1.45
State Univ. of New York, Brooklyn. Downstate Medical Center.
NEW APPROACHES IN THE SELECTION OF MATERIALS COMPATIBLE WITH BLOOD.
Annual rept. 1 Dec 72-31 Dec 73,
Philip N. Sawyer, and Supramanium Srinivasan. 8 Feb 74, 68p* 6 PH-43-68-75-6
Contract PH-43-68-75
See also PB-215 885.

Descriptors: *Mechanical organs, *Metals, *Mechanical hearts, *Blood coagulation, Stainless steels, Electrochemistry, Fibrinogen, Adsorption, Thrombosis, Heparins, Blood proteins, Copper, Electrophoresis, Aluminum, Silver, Gold.
Identifiers: *Blood compatible materials, *Biomaterials, *Cardiac assist devices.

The interfacial reactions of fibrinogen were studied using electrochemical techniques. The products of the reactions were analyzed for clotting time, clottable protein, ultraviolet absorption and polyacrylamide gel electrophoresis patterns. Significant changes were observed in thrombin recalcification times(TRT). The effect of variation of pH on the TRT of fibrinogen was determined. Both acidic and alkaline pHs increase the TRT. Metal powders react with fibrinogen affecting the protein differently. Copper is chelated by fibrinogen and plasma proteins and no TRT, partial thromboplastin, or recalcification times could be determined. Silver and gold do not affect the TRT of fibrinogen, however, the concentration of fibrinogen is reduced as a result of the treatment with these metal powders. Aluminum has hardly any effect on the protein(fibrinogen). Anodic electrolysis of prothrombin probably generates a product similar to prethrombin as revealed by trypsin induced prothrombin-thrombin conversion tests and gel electrophoresis data.

PB-229 870/1GA PC$3.25/MF$1.45
Utah Univ., Salt Lake City. Inst. for Biomedical Engineering.
DEVELOPMENT OF MORE EFFICIENT, LESS COSTLY ARTIFICIAL KIDNEYS: ADSORBENT HEMOPERFUSION.
Annual rept. no. 4, 25 Dec 72-24 Dec 73,
W. J. Kolff, and Joseph D. Andrade. 10 Aug 73,
42p AK-5-43-68-1027
Contract PH-43-68-1027
See also PB-210 476.

Descriptors: *Artificial kidneys, *Adsorbents, *Activated carbon, In vivo analysis, In vitro analysis, Amino acids, Blood, Performance evaluation, Dialyzers, Mechanical organs, Adsorption, Polyacrylates, Platelets, Ultrasonic cleaning.
Identifiers: Blood compatible materials, Creatinine, Poly(Methacrylic acid/(hydroxyethylester)), Hemodialysis.

The continued development of activated carbon hemoperfusion is presented in detail with emphasis on carbon coating with polyhydroxyethyl methacrylate; in vitro adsorption of creatinine, drugs and amino acids; carbon washing and fine particle characterization--in vitro and in vivo; column configuration and pressure drop studies and platelet interactions.

PB-229 900/6GA PC$3.25/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
ARTIFICIAL KIDNEYS: BIOCHEMICAL EVALUATIONS.
Annual rept. 13 Dec 72-30 Sep 73,
John H. Peters, and Frank A. Gotch. 1 Oct 73,
32p* AK-1-43-66-1132
Contract PH-43-66-1132
See also PB-224 912.

Descriptors: *Artificial kidneys, *Amino acids, Evaluation, Dialysis, Biochemistry, Proteins, Filtrates, Membranes, Uremia, Urologic diseases.
Identifiers: *Hemodialysis, Clinical chemistry.

The dialysance of amino acids and conjugated amino acids was measured in patients being maintained by hemodialysis with the Model 4 Cordis Dow hollow fiber artificial kidney. Dialysance and molecular weights of the amino acids were inversely related. Conjugated amino acids were cleared poorly from the blood compared to that of the unconjugated amino acids. Comparative determinations of the amounts of conjugated amino acids in protein-free filtrates prepared by chemical and physical means showed that the latter method yielded substantially larger amounts of these materials. Sephadex column chromatography of plasma from uremic patients yielded elution patterns that differed from those obtained from plasma of normal subjects in showing a 280-nm absorbing peak that decreased after dialysis and increased during a uremic crisis in an undialyzed patient. Microbore Sephadex column chromatography of the peak fractions indicated the presence of peptides in the molecular weight range of 1200-1400 daltons.

PB-229 925/3GA PC$3.25/MF$1.45
Southern Research Inst., Birmingham, Ala.
ACTIVATED CARBON FIBERS FOR ARTIFICIAL KIDNEY DEVICES.
Annual progress rept. Oct 72-Aug 73,
Thomas A. Davis. 6 Aug 73, 39p SORI-EAS-73-260 AK-2-72-2208
Contract PHS-72-2208

Descriptors: *Activated carbon, *Artificial kidneys, *Carbon fibers, Mechanical organs, Adsorption, Urea, Uric acid, In vitro analysis, Fiber composites, Hydroxyethyl cellulose.
Identifiers: Creatinine, Hemoperfusion, Carbon fibor reinforced plastics.

Activated carbon fibers were made by wet-spinning a dispersion of powdered activated carbon in hydroxyethylcellulose solution. The resulting monofilament had 70% (dry basis) of activated carbon encapsulated in a water-swollen cellulosic binder that was quite permeable to uric acid and creatinine. The fibers were wound onto a perforated spindle and inserted into a ribbed container to form a hemoperfusion cartridge. In vitro evaluations demonstrated that the cartridges effectively removed uric acid and creatinine from aqueous solutions. Ultimately such cartridges may supplement or replace hemodialysis in the treatment of uremia.

PB-230 010/1GA PC$3.75/MF$1.45
CBS Labs., Stamford, Conn. Intelligence Systems Dept.
PROSPECTIVES FOR ULTRASONIC IMAGING IN MEDICAL DIAGNOSIS. REPORT OF THE NSF SURVEY TEAM ON ULTRASONIC IMAGING.
Final rept.
Nov 73, 54p*
Contract NSF-C796

Descriptors: *Ultrasonic radiation, *Images, Bioinstrumentation, Medical equipment, Diagnosis, Sound waves.
Identifiers: *Ultrasonic imaging.

A survey team was established to determine the state-of-the-art of ultrasonic imaging for medical diagnostic purposes on a world-wide basis. This report relates their findings.

PB-230 309/7GA PC$3.25/MF$1.45
Washington Univ., St. Louis, Mo. Materials Research Lab.
MATERIALS DEVELOPMENT AND TESTING.
Annual rept. 1 Oct 72-30 Nov 73,
J. L. Kardos, C. Thies, R. E. Clark, B. Mehta, and S. F. Apostolou. 31 Jan 74, 45p NIH-73-2909-1
Contract PHS-73-2909

Descriptors: *Prosthetic devices, *Polyurethane resins, *Polyether resins, Composite materials, Plastic coatings, Anticoagulants, Surface properties, Blood vessels, Blood coagulation.
Identifiers: *Biomaterials, *Blood compatible materials.

In the study the authors have clearly demonstrated the feasibility of utilizing composite material technology to design and fabricate a laminated, segmented polyetherurethane tube which duplicates the mechanical stiffness anisotropy of living blood vessels. Individual films of the copolymer must be cast under low humidity conditions to avoid surface heterogeneity arising from phase separation. Contact angle analysis appears to be a feasible technique for monitoring surface morphology changes caused by straining or environmental interactions. These thin individual films (6 mils) can be uniaxially hot-stretched to elongations as high as 125% at 0.2 inches/minute as long as the temperature is held at 130 plus or minus 2C. Mechanically stable laminates can be fabricated by hot-pressing the stretched films at 800 psi and 45-50C for 4-6 hours followed by slow-cooling to room temperature under pressure. Mechanically stable tubes can be made by forming a lap joint using adhesive bonding.

6M. Microbiology

AD-776 435/0GA Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
INACTIVATED VENEZUELAN EQUINE ENCEPHALOMYELITIS VACCINE PREPARED FROM ATTENUATED (TC-83 STRAIN) VIRUS,
Francis E. Cole, Jr., Stephen W. May, and Gerald A. Eddy. 4 Sep 73, 5p
Availability: Pub. in Applied Microbiology, v27 n1 p150-153 Jan 74.

Descriptors: *Vaccines, *Venezuelanequine encephalomyelitis virus, Arboviruses, Viruses, Preparation, Formaldehyde, Inactivation, Antigens.

Formalin-inactivated Venezuelan equine encephalomyelitis vaccine was prepared from virus propagated in rolling-bottle cultures of chicken embryo cells. The attenuated, TC-83 strain of virus was propagated in these cultures with a maintenance medium consisting of serum-free medium 199 containing 0.25% human serum albumin and antibiotics. By adjustment of maintenance medium volume (100 to 300 ml) and multiplicity of inoculum (0.04 to 0.00004), high-titered yields of virus were obtained with minimal cell destruction at convenient harvest times, viz, 18 to 24 h postinoculation. Inactivation of virus at 37 C was complete between 8 to 10 h with 0.05% Formalin and within 6 to 8 h with 0.1% Formalin. Antigen extinction potency tests in mice indicated that potent vaccines could be produced at both Formalin concentrations and, furthermore, that potency was not adversely affected by inactivation periods of up to 96 h. (Author)

AD-776 458/2GA Reprint
Naval Medical Research Unit No 4 Great Lakes Ill
SEROLOGICAL GROUPING OF HEMOLYTIC STREPTOCOCCI BY COUNTER-IMMUNOELECTROPHORESIS,
Earl A. Edwards, and George L. Larson. 9 Jul 73, 9p
Availability: Pub. in AppliedMicrobiology, v26 n6 p899-903 Dec 73.

Descriptors: *Streptococcus, Serodiagnosis, Bacterial diseases, Polysaccharides, Sensitivity, Test methods.
Identifiers: Counter immunoelectrophoresis.

The counter-immunoelectrophoresis (CIE) method of grouping streptococci was more sensitive than the capillary precipitin method. The precipitate was easier to read, and the test was simple to perform and required fewer reagents. An autoclave-Pronase-B extraction procedure is described and was found superior to either acid, Pronase-B, or the autoclave extraction procedures for recovering groupable polysaccharide from different strains of streptococcal groups A, B, C, D, F, and G. Data obtained from over 400 strains indicate that the sensitivity of the CIE and a more efficient extraction of groupable polysaccharide provides a simple method for rapid diagnosis of streptococcal infections. (Author)

AD-776 623/1GA Reprint
Armed Forces Inst of Pathology Washington D C

TYPE-A INFLUENZA VIRUSES ISOLATED FROM WILD FREE-FLYING DUCKS IN CALIFORNIA,
Richard D. Slemons, Daryle C. Johnson, John S. Osborn, and Frank Hayes. 10 Sep 73, 6p
Availability: Pub. in Avian Diseases, v18 n1 p119-124 Jan/Mar 74.

Descriptors: *Influenza virus, Disease vectors, Antigen antibody reactions, Viruses, Birds, Serology, Infectious diseases.
Identifiers: Hemagglutination inhibition tests.

From 6 October 1972 to 3 December 1972, 41 type-A influenza virus isolants were recovered from free-flying wild ducks, and seven isolants from domestic ducks in southern California. The type-specific antigen (ribonucleoprotein) was identified by the agar-gel-diffusion test, and tentative identification of one strain-specific antigen (hemagglutinin) was attempted by the hemagglutination-inhibition test. These isolants support the theories that wild birds play an important role in the dissemination of type-A influenza viruses and may provide optimum conditions for genetic interaction of type-A influenza viruses, resulting in new hybrid strains.

AD-776 646/2GA Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
MICROAGGLUTINATION TEST FOR DETECTING AND MEASURING SERUM AGGLUTININS OF 'FRANCISELLA TULARENSIS',
Eugene D. Massey, and Joseph A. Mangiafico. 20 Sep 73, 3p
Availability: Pub. in Applied Microbiology, v27 n1 p25-27 Jan 74.

Descriptors: *Pasturella tularensis, *Serodiagnosis, Response(Biology), Antibodies, Infectious diseases, Bacteria, Epidemiology, Detection, Antigens + antibodies.
Identifiers: Agglutination.

A microagglutination method utilizing stained antigen for detecting and measuring serum agglutinins against Francisella tularensis is described. The microagglutination and standard tube agglutination techniques were demonstrated to be comparable in sensitivity and specificity. Advantages of the micro method are rapidity and ease of performance, economy of reagents and, in particular, ease of interpreting specific reactivity. (Author)

AD-776 662/9GA PC$3.25/MF$1.45
Northwestern Univ Chicago Ill Dept of Microbiology
STUDY OF THE IMMUNOCHEMISTRY AND IMMUNIZING PROPERTIES OF A UNIQUE ANTIGENIC MATERIAL ISOLATED FROM THE STAPHYLOCOCCI.
Final rept. 1 Mar 71-31 Dec 73,
Richard D. Ekstedt. 29 Mar 74, 28p
Contract N00014-67-A-0356-0019
See also report dated 16 Jan 73, AD-754 435.

Descriptors: *Staphylococcus aureus, *Immunology, Antigens, Immunity, Antigen antibody reactions, Serology, Agglutinins, Polysaccharides, Chemical properties, Mice, Experimental data.
Identifiers: Immunochemistry, Hemagglutination.

The report summarizes studies done on the immunochemistry and immunizing properties of a polysaccharide slime layer material synthesized by strains of S. aureus when cultured under appropriate conditions on a modified Staphylococcus 110 medium. It was found that the polysaccharide was composed of a polymer of galactose and galacturonic acid, but also contained significant amounts of glycine, proline, glutamic acid,and alanine. Neither active nor passive immunization studies with a number of recently isolated or laboratory strains of S. aureus consistently demonstrated any protection inducing antigenic properties in slime layer against experimental challenge of mice with the Smith, diffuse strain of S. aureus or with homologous non-Smith strains. It was also demonstrated that the antigen(s) present in slime layer material adsorbed spontaneously to erythrocytes from several species and sensitized them for passive hemagglutination in the presence of staphylococcal antibody. (Modified author abstract)

AD-776 668/6GA Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
OYSTERS: RETENTION AND EXCRETION OF THREE TYPES OF HUMAN WATERBORNE DISEASE BACTERIA,
Werner A. Janssen. 13 Jun 73, 6p
Availability: Pub. in Health Laboratory Science, v11 n1 p20-24 Jan 74.

Descriptors: *Bacterial diseases, *Oysters, *Disease vectors, Pathogenic materials, Pasteurella tularensis, Bacteria, Shellfish, Mollusca, Shigella flexneri, Public health, Infectious diseases, Salmonella typhimurium, Dysentery, Tularemia, Gastroenteritis, Experimental data.
Identifiers: Crassostrea.

Oysters experimentally contaminated with bacteria which cause bacillary dysentery (Shigella flexneri), tularemia (Francisella tularensis), or gastroenteritis (Salmonella typhimurium) retained and excreted the organisms for markedly different time periods in artificial brackish water continuously decontaminated by ultraviolet light. Sh. flexneri appeared to be removed within 24 h; excreted organisms were not detected in the aquatic environment. F. tularensis was retained for at least 11 days; excretion of these organisms was detected for nine days. S. typhimurium persisted in oysters for the entire 49 days of the experiment and were excreted in sufficient numbers to be detected for 14 days. These findings indicate that depuration, or 'self-cleaning,' procedures currently in use for commercial oysters based on removal of fecal coliform bacteria within 48 h may be deceptive and ineffective in removing some human waterborne disease organisms. (Author)

AD-776 684/3GA Reprint
East Jefferson General Hospital Metairie La
EFFECT OF TEMPERATURE OF INCUBATION ON PERFORMANCE OF MEDIA IN THE DETECTION OF ENTERIC PATHOGENS,
Welton I. Taylor, and Dorothy Schelhart. 26 Feb 73, 6p AROD-11709.1-L
Contract DAHC19-71-C-0028
Availability: Pub. in Applied Microbiology, v25 n6 p940-944 Jun 73.

Descriptors: *Enterobacteriaceae, *Salmonella, *Shigella, Pathogenic microorganisms, Temperature, Incubation, Bacteria, Cultures(Biology), Growth(Physiology), Culture media, Isolation.

The effect of incubation temperatures on the efficacies of both plating media and transport or enrichment broths was determined by the analysis of 391 diarrheal stools for salmonellae and shigellae. Each analysis resulted in 90 observations. Stool specimens were homogenized in saline and used to inoculate eosin methylene blue (EMB), Salmonella-Shigella (SS), and xylose lysine deoxycholate (XLD) agar plates, Amies and Cary-Blair (CB) transport media, and gram-negative (GN) enrichment broth. All media were incubated at 25, 30, and 35 C for 24 and 48 h. In order of efficacy, GN and saline were significantly better than Amies and CB, which were still better than direct streaking for both salmonellae and shigellae. Forty-eight hours was a significant improvement over 24 h only at 25C on direct streaking for both pathogens. Salmonella detection was also improved at 30 over 25C on direct streaking. In direct plating, XLD was better than both SS and EMB for both pathogens. (Modified author abstract)

AD-776 744/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF CERTAIN ANTIMETABOLITES AND OF CHLORAMPHENICOL ON CONJUGATION OF E. COLI K-12,
I. I. Belousova, and I. M. Tereshin. 11 Mar 74, 6p Rept no. FTD-HT-23-950-74
Edited trans. of Nauchno-Issledovatelskii Institut Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, 4-5 Jun 64. Materialy, n.p., n.d., p10-12, by Dean F. W. Koolbeck.

Descriptors: *Escherichia coli, *Genetics, *Antibiotics, *Antimetabolites, Resistance(Biology), Bacteria, Reproduction(Physiology), Drugs, Translations, USSR.

There is major interest in studying the role of processes of transfer of genetic information in bacteria -- conjugation, transformation, and transduction -- in the appearance and propagation of antibiotic-resistant forms of microorganisms. Many researchers have established that by means of the above genetic processes it is possible to transform strains of certain types of bacteria which are sensitive to antibiotics into antibiotic-resistant organisms. The authors studied the effect of chloramphenicol, 5-bromouracil (5-BU), and 8-azaguanine (8-AG) on the conjugation of E. coli K-12 on the transfer of genetic markers from the donor to the recipient.

AD-776 926/8GA PC$3.25/MF$1.45
Army Medical Research and Nutrition Lab Denver Colo
REPORT OF ANALYSES OF 1972 MICROBIOLOGICAL DATA COLLECTION PROGRAM,
James L. Fowler, Patrick B. Ruckh, Thomas G. Murnane, and William F. Ganz. 1 Nov 73, 45p Rept no. USAMRNL-339

Descriptors: *Microbiology, Food poisoning, Pathogenic materials, Tolerances(Physiology), Public health, Laboratory procedures, Data storage systems.
Identifiers: *Biomedical information systems, *Food contamination.

A large volume of valuable food microbiological data is generated annually by Department of Defense laboratory facilities. These data have great potential applications in military public health and as a research tool in food hygiene. A Centralized Computerized Microbiological Data Collection Program was designed and implemented by the Food Hygiene and Computer Division, U.S. Army Medical Research and Nutrition Laboratory. During the calendar year 1972, there were 11 DoD laboratories which participated in the program. Microbiological food testing data from these laboratories were transmitted to USAMRNL, where it was coded and entered into a computer file. At the end of the year, data were retrieved by selected codes. The result of analyses of this file is presented in the form of graphs and tables. (Author)

AD-776 941/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NATURAL VARIABILITY OF THE TRYCHOMYCIN PRODUCER 'ACTINOMYCES HACHIJOENSIS', STRAIN 1831/23,
M. v. Fursenko. 25 Mar 74, 6p Rept no. FTD-HT-23-988-74
Edited trans. of Nauchno-Issledovatelskii Institut Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, 4-5 Jun 64. Materialy, n.p., n.d., p88-80, by Dean F. W. Koolbeck.

Descriptors: *Antibiotics, *Actinomyces, Bacteria, Morphology(Biology), Culture media, USSR, Translations, Yeasts, Chemotherapeutic agents, Infections.

Identifiers: Actinomyces hachijoensis, *Trichomycin Trichomonas, Trichomonas.

A study was made of the natural variability of Actinomyces hachijoensis, strain No. 1831/23, isolated and described and active with respect to the genus Trichomonas, which made it possible to use strain 1831/23 for development of technology for preparing trychomycin. A study of the natural variability of Act. hachijoensis, strain 1831/23, and subsequent sampling resulted in isolation of the pigment-forming variant No. 10 with reduced aerial mycelium; its activity is 70% higher than that of the initial strain both with respect to yeasts and against Trichomonas.

AD-777 001/9GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
EFFECT OF DEAE-DEXTRAN AND DIMETHYLSULFOXIDE ON THE RESULTS OF TITRATION OF PARAINFUENZA, RESPIRATORY SYNCYTIAL AND RHINOVIRUSES IN CELL CULTURES,
L. L. Nisevich, L. A. Konstantinova, and V. M. Stakhanova.. 1974, 9p
Trans. of Voprosy Virusologii (USSR) v17 p344-347 1972.

Descriptors: *Parainfluenza virus, *Rhinoviruses, *Dextran, *Sulfoxides, Tissue culture cells, Growth(Physiology), Ribonucleic acids, Viruses, Culture media, USSR, Translations.
Identifiers: *Respiratory syncytial virus, *Methyl sulfoxide.

In the past few years there have appeared many studies devoted to increasing the titer of viruses and infection ribonucleic acid (RNA) when titrating with various substances. In earlier studies the present authors pointed out that preliminary treatment of a tissue culture with DEAE-dextran in large concentrations increases the infection titer of parainfluenza viruses, while it has no effect on that of the rhinoviruses. This method, however, is quite laborious, and in addition requires lengthy exposure, as well as repeated careful washing of the tissue culture cells. The present study was devoted to the use of DEAE-dextran and dimethylsulfoxide (DMSO) in low concentrations in the supporting medium.

AD-777 002/7GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
SOME PATTERNS OBSERVED IN THE INTERFERON EFFECT,
E. B. Tazulakhova, and F. I. Ershov. 1974, 13p
Trans. of Antibiotiki (USSR) v17 n10 p940-945 1972.

Descriptors: *Interferon, *Antiviral agents, Cells(Biology), Viruses, Infections, Resistance(Biology), Sensitivity, Arboviruses, USSR, Translations.

The authors found that the level of cell resistance resulting from the effects of interferon depends upon the concentration of the drug and the period consumed in administration, and also upon the multiplicty of the infection which is present. Resistance was first noted 1-2 hours following administration of interferon, following which it reached a maximum by the 5th-6th hours, remaining at a constant level indefinitely as long as interferon continued present in the culture fluid. For maximum effect, however, the interferon should be in contact with the cells previously. When the latter precaution was observed, the culture cells showed complete protection from the after-effects of the virus. (Modified author abstract)

AD-777 045/6GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
ARBOVIRUS SEROLOGICAL SURVEY OF INDONESIANS RESIDING WITHIN A 50 KM. RADIUS OF JAKARTA IN 1963.
Technical rept.,
I. J. Green, H. S. Hurlbut, H. M. Yu, K. H. Gan, and H. M. Jenkin. 15 Sep 72, 12p Rept no. NAMRU-2-TR-581
Sponsored in part by Advanced Research Projects Agency, Arlington, Va. Summary in Chinese.
Availability: Pub. in Chinese Jnl. of Microbiology, v6 p149-156 1973.

Descriptors: *Indonesia, *Arboviruses, Epidemiology, Virus diseases, Serology, Blood serum, Surveys, Tissue culture, Antibodies, Population.

An arbovirus serum survey conducted in March 1963 among residents of various communities within a 50 km radius of Jakarta, Indonesia. The 497 sera collected were analyzed both qualitatively and quantitatively by tissue culture neutralization test for antibodies to Chikungunya, Sindbis, Eastern equine encephalitis, Japanese encephalitis, Yellow Fever, and Bunyamwera virsus. Evidence for the presence of group A, B and Bunyamwera viruses in the areas surveyed is presented. Analysis of the data obtained suggests that Chikungunya, Japanese encephalitis and a virus antigenically related to Bunyamwera were most likely present in most of these communities. (Author)

PAT-APPL-434 180 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
VIBRIO VACCINE AND IMMUNIZATION.
Patent Application,
John L. Fryer, Robert L. Garrison, Jim S. Nelson, and John S. Rohovec. Filed 17 Jan 74, 10p
DOCKET/FSF-2140
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Vaccines, *Patent applications, Vibrio, Immunity, Viral diseases, Antigens, Preparation, Fishes.
Identifiers: PAT-CL-424-92, *Vibrio anguillarum.

The invention relates to a new and useful improvement in vibrio vaccine and immunization, of which the following is a specification. An antigenic composition which provides immunization of salmonids against vibriosis is prepared by inoculating a culture medium with Vibrio anguillarum, growing the cells, rendering them non-viable and harvesting these cells to be used as a vaccine. The invention involves the immunization of fish against the disease vibriosis which is caused by the fish pathogen V. anguillarum.

PB-230 456/6GA PC$5.50/MF$1.45
Delaware Univ., Newark. Dept. of Biological Sciences.
THE EFFECT OF STRESS AND NON-STRESS CONDITIONS UPON THE INTERACTION OF PLECTONEMA BORYANUM AND THE LPP-PHYCOVIRUSES.
Doctorial thesis,
Robert E. Cannon. Jun 73, 46p* W74-05960, OWRR-A-016-DEL(4)

Descriptors: *Aquatic microbiology, *Algae, *Plant viruses, Stress(Physiology), Cyanophyta, Antibiotics, Metals, Nutrients, Aquatic microorganisms, Aquatic plants, Theses.
Identifiers: Plectonema boryanum, LPP phycoviruses, Lysogeny, Host parasite relations, Water pollution effects(Animals).

Lysogeny was established in Plectonema boryanum, a filamentous blue-green alga, by LPP-1D and LPP-2 phycoviruses after treatment of the alga with antibiotics, heavy metal, and nutrient limitation. Mitomycin C induction and viral neutralization confirm lysogeny. Infection of antibiotic treated cells by LPP-1 virus failed to establish lysogeny, indicating that LPP-1 is a virulent phycovirus while LPP-1D and LPP-2 were found to be temperate viruses. Continuous culture techniques were also used to study long-term population interactions of Plectonema and the LPP-viruses. After LPP-1 infection of sensitive algae, three oscillations occur in cell density with concomitant increases in virus before final stabilization of both algal and phycoviral populations. After LPP-1D and LPP-2 infection, only one fall in cell density occurs with a burst of virus particles. Resistant algae always repopulated; lysogeny was never established in chemostat experiments.

TT-73-52026 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
INTENSITY OF RESPIRATION AND ACTIVITY OF OXIDATIVE ENZYMES IN THE FUNGUS 'FOMITOPSIS ANNOSA' (FR.) BOND ET SING (OB INTENSIVNOSTI DYKHANIYA I AKTIVNOSTI OKISLITELNYKH FERMENTOV U GRIBA 'FOMITOPSIS ANNOSA' (FR.) BOND ET SING),
S. F. Negrutskii. 1973, 12p
Technical trans. of Selskokhozyaistvennyi Institut, Lugansk. Nauchnye Zapiski (USSR) v8 p240-245 1961, by A.K. Dhote. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Fungi, *Plant metabolism, *Enzymes, Oxidation, Parasites, Physiology, USSR, Translations, Decay, Growth, Trees(Plants), Respiration, Experimental data.
Identifiers: *Fomitopsis annosa, Butt rot fungus.

The intensity of respiration of mycelia of the root fungus when recalculated to 1 g dry weight is equivalent to 52.5 mg of CO2 per day; hence, the intensity of fungus respiration does not lag behind the respiration rate of germinating seeds. Accumulation of alcohol, as a result of fermentation of organic matter, mainly saccharase, occurs in cultures of fungus grown under conditions of both oxygen availability and oxygen non-availability. However, in the latter case, especially when the experiment was continued for 30 days, the alcohol content was considerably higher (about eight times). In the fruiting bodies of root fungus, especially in the annual ones, there is a significant quantity of oxidase. Peroxidase was detected only in the young fruiting bodies of the fungus. Activity of catalase remains at an appreciably high level; in the annual fruiting bodies it is 80.8% higher than in biennials.

TT-73-52027 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
PHYSIOLOGICAL AND BIOCHEMICAL CHARACTERISTICS OF THE FRUITING BODY OF 'FOMITOPSIS ANNOSA' BOND ET SING (FIZIOLOGO-BIOKHIMICHESKAYA KHARAKTERISTIKA PLODOVOGO TELA 'FOMITOPSIA ANNOSA' BOND ET SING),
S. F. Negrutskii. 1973, 13p
Technical trans. of Selskokhozyaistvennyi Institut, Lugansk. Nauchnye Aapiski (USSR) v8 p246-253 1961, by A.K. Dhote. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Fungi, Plant chemistry, Plant physiology, USSR, Translations, Parasites, Tannic acid, Trees(Plants), Moisture content, Ash content, Chemical analysis, Sugars, Proteins.
Identifiers: *Fomitopsis annosa, Butt rot fungus.

The chemical composition of the wood-destroying fungi has not as yet been adequately investigated and there is very scanty information available on this subject. Analysis of the available data reveals that the chemical composition of fungi varies fairly significantly depending on the particular conditions of vital activity caused by parasitism, saprophytism, or by the peculiarities of development. Since information on root fungus-the most widespread and economically harmful pest of coniferous wood species-is totally absent, and as there are only isolated and incomplete data on

other core fungi, the authors conducted research to understand the chemical nature of fruiting bodies and the Fomitopsis annosa mycelia.

TT-73-52028 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
FUNGUS FOMITOPSIS ANNOSA (FR.) BOND ET SING. AND PATHOPHYSIOLOGY OF THE TREE (GRIB FOMITOPSIS ANNOSA (FR.) BOND ET SING. I PATOFIZIOLOGYA DEREVA),
S. F. Negrutskii. 1973, 13p
Technical trans. of mono. Povyshenie Produktivnosti Lesov Zapadnykh i Tsentralnykh Rayonov SSSR, n.p., 1962 p108-117, by A.K. Dhote. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Fungi, *Fungus diseases, *Plant diseases, Plant physiology, Parasites, USSR, Translations, Pathophysiology, Decay, Wood, Trees(Plants).
Identifiers: *Fomitopsis annosa, Butt rot fungus.

In the coniferous forest of the Soviet Union and many countries of Eroupe, America, and Asia the fungus Fomitopsis annosa (root fungus) is one of the most widespread and lethal pests. Mass desiccation of plantations over a large area, decreasing the value of wood as a result of rotting, has compelled investigators of many countries to study the biological properties of the root fungus and to formulate preventive measures. The author's experimental investigations have continued since 1951 until the present, and have covered infection by root fungus of the trees of pine, larch, fir, spruce, cedar and juniper.

6N. Personnel Selection and Maintenance (Medical)

AD-776 438/4GA Reprint
School of Aerospace Medicine Brooks AFB Tex
A USEFUL TEST IN SELECTING MOTION-SICK-PRONE INDIVIDUALS,
Patrick J. Dowd. 25 Apr 73, 14p Rept no. SAM-TR-73-250
Partially presented at the AGARD Conference on Predictability of Motion Sickness in the Selection of Pilots, NATO, held in Glasgow (Scotland), in Sep 72.
Availability: Pub. in Space Life Sciences, v4 p391-401 1973.

Descriptors: *Motion sickness, Vestibular apparatus, Coriolis effect, Acceleration tolerance, Sensitivity, Medical examination, Aviation personnel.

The test is a result of the past decade of studies investigating the vestibular sensitivity of individuals to Coriolis accelerations. A significant differentiation shown between the 'nonsick' (NS) and the 'sick' (S) subjects within each peer group (navigators, pilots, and nonflying personnel) indicates its value in testing the level of resistance an individual has to Coriolis accelerations: this supports its usefulness in determining an individual's resistance to motion sickness. The studies - conducted on experienced pilots (NS-299, S-51), navigators (NS-60, S-34), airman trainees (NS-91, S-19), and pentathlon athletes (NS-14, S-0) - demonstrate the usefulness of this test in the overall selection of personnel in preflight, postflight, and training programs. (Author)

6O. Pharmacology

AD-776 393/1GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
THE EFFECTS OF BETA-DIETHYLAMINOETHYL-DIPHENYL-PROPYLACETATE (SKF-525-A) ON SICKLING IN VITRO.
Technical rept. Oct 71-Jun 72,
Vincent F. Garry, Jr., Priscilla A. Gilman, Dale H. Heitkamp, and Kenneth Mills. Mar 74, 14p Rept no. EB-TR-74003

Descriptors: *Sickle cells, *Surface active substances, Drugs, Chemotherapy, Acetates, Amines, Erythrocytes, Hemoglobin, Blood diseases, Anemias.
Identifiers: *Sickle cell anemia, SKF-525-A.

Beta-diethylaminoethyl-diphenylpropylacetate (SKF-525-A), a surface-active agent, inhibits sickling of erythrocytes from individuals with homozygous sickle cell anemia (SS cells) in vitro. Sickling was prevented when SS cells were incubated in .0003 M SKF-525-A, washed free of excess drug, and then deoxygenated in humidified nitrogen atmosphere. Polymerization of sickle hemoglobin and submembrane vesicles could be demonstrated in these cells by electron microscopy. At .0003 M SKF-525-A approximately 10% of the cells lysed. Incubation of pretreated cells at 37C without added oxygen for 24 hours did not produce significant additional lysis. Irreversibly sickled cells were unaffected by drug treatment. Preliminary studies suggest that the oxygen affinity of sickle hemoglobin in the intact cell is not altered by SKF-525-A. It is hypothesized that inhibition of sickling is the result of drug-induced alterations of the cell membrane. (Author)

AD-776 573/8GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INFLUENCE OF RAUSEDIL AND IPRAZIDE ON THE BIOELECTRIC ACTIVITY OF THE RABBIT BRAIN,
N. G. Sergienko, O. M. Gorbachev, and L. I. Paikova. 6 Feb 73, 5p Rept no. FSTC-HT-23-1740-72
Trans. of Meditsinskii Institut, Kharkov. Sbornik Nauchnykh Trudov (USSR) n69 p113-115 1967.

Descriptors: *Bioelectricity, *Reserpine, *Electroencephalography, Cerebral cortex, Brain, Serotonin, Levarterenol, Neurochemistry, Pharmacology, USSR, Translations, Rabbits, Experimental data.
Identifiers: *Iproniazid.

Reported are studies on the bioelectrical activity of the cerebral cortex following the administration of rausedil (reserpine) and iprazide, which exert an influence on metabolism and content of noradrenaline and serotonin in the central nervous system.

AD-776 648/9GA PC$3.75/MF$1.45
Johns Hopkins Univ Baltimore Md Dept of Chemistry
INTERACTION OF RARE GASES WITH MODEL MEMBRANES AND ITS IMPLICATION FOR NARCOSIS.
Final rept. 1 Jun 70-31 Aug 73,
Walter S. Koski. 22 Mar 74, 63p
Contract N00014-67-A-0163-0007

Descriptors: *Rare gases, *Anesthetics, *Biomolecules, Membranes(Biology), Biophysics, Ion exchange, Models, Bioassay, Biochemistry, Physiology, Hyperbaric conditions, Shrimp.
Identifiers: *Narcosis, Inert gas narcosis, Molecular biology.

A study is reported of the interaction of rare gases and other anesthetic agents with membranes and the findings are examined for their implication on narcosis. The report is divided into four categories: The development of an appropriate bioassay method for determining the anesthetic potency of the inert gases as well as other volatile anesthetics; the physicochemical aspects of the action of general anesthetics agents is examined on a molecular basis; some very preliminary observations on the effect of inert gases on ion transport in frog sartorius muscle; the non-applicability of the widely used INDO method to the calculation of the intermolecular energies that play such an important role in anesthesia as well as many other biological processes.

AD-776 755/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF NEOMYCIN PREPARATIONS BY THE COUNTERCURRENT DISTRIBUTION METHOD,
V. A. Sannikov. 11 Mar 74, 7p Rept no. FTD-HT-23-983-74
Edited trans. of Nauchno-Issledovatelskii Institut Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, 4-5 Jun 64. Materialy, n.p., n.d., p76-77, 80, by Dean F. W. Koolbeck.

Descriptors: *Neomycins, *Antibiotics, Chemical analysis, Chemotherapeutic agents, Identification, Purification, USSR, Translations.

The method of countercurrent distribution is widely used in analytical practice and assumes distribution of substances between two liquid phases. In this work it was used to determine the components in neomycin antibiotics: colimycin, mycerin, and framycetin. It is known that neomycin represents a hydrophilic base which dissolves well in water and is virtually insoluble in many organic solvents. In order to change the hydrophilic properties of this antibiotic use was made of aryl or alkyl sulfonic acids which with neomycin form products of an apparently complex nature. These products are quite stable in solution.

AD-776 757/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHYCYCLINE AND ITS CHEMOTHERAPEUTIC PROPERTIES,
A. V. Guzeeva, and M. D. Paikin. 11 Mar 74, 8p Rept no. FTD-HT-23-955-74
Edited trans. of Nauchno-Issledovatelskii Institu Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, 4-5 Jun 64. Materialy, n.p., n.d., p19-22, by Dean F. W. Koolbeck.

Descriptors: *Chemotherapeutic agents, *Tetracyclines, *Antibiotics, Streptococcus, Staphylococcus, Pneumonia, Respiratory diseases, USSR, Translations, Experimental data, Mice.
Identifiers: *Methycycline.

The application of methycycline in treatment of the experimental models of acute streptococcal sepsis and acute staphylococcal penumonia gives good results. A new water-soluble tetracycline derivative was obtainted - methycycline. Methycycline was effective during experimental coccal infections with intravenous, intramuscular, and inhalation administration.

AD-776 882/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SEPARATION AND IDENTIFICATION OF SUBSTANCES IN THE MOTHER LIQUOR AFTER CRYSTALLIZATION OF GRISEOFULVIN RAW MATERIAL,
G. V. Efimova. 25 Mar 74, 7p Rept no. FTD-HT-23-956-74
Edited trans. of Nauchno-Issledovatelskii Institut Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, 4-5 Jun 64. Materialy, n.p., n.d., p22-23, by Dean F. W. /Koolbeck.

Descriptors: *Griseofulvin, *Antibiotics, Drugs, Fungi, Solvent extraction, Identification, Chemical analysis, Ergot alkaloids, USSR, Translations.
Identifiers: Penicillium, Palmitic acid.

Ergosterol and palmitate of ergosterol were isolated from Penicillium notatum. The separation of one or another of them has been reported for other

types of penicillin. This is the first report of the isolation of ergosterol and palmitate of ergosterol from griseofulvin producers.

AD-776 893/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROTONATION REACTION AS A METHOD FOR IDENTIFICATION OF HEPTAENE ANTIBIOTICS OF THE CANDICIDIN GROUP,
I. Ya. Bershtein. 11 Mar 74, 6p Rept no. FTD-HT-23-951-74
Edited trans. of Nauchno-Issledovatelskii Institut Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, Jun 64. Materialy, n.p., n.d., p12-13, by Dean F. W. Koolbeck.

Descriptors: *Antibiotics, Addition reactions, Protons, Chemical analysis, Physical properties, Identification, USSR, Translations, Drugs.
Identifiers: *Heptenes, Trichomycin, *Candicidin.

The identification of aromatic heptaene antibiotics of the candicidin group (trichomycin, levorin, candicidin) has been hampered due to the complete coincidence of the usual physicochemical parameters for these antibiotics. They can be distinguished only by extremely complex analysis methods - counterflow distribution, IR and NMR spectra. In seeking a fairly simple method of establishing the authenticity of these antibiotics for mass analysis, the authors noticed that all of them form intensively blue solutions in concentrated sulfuric acid. This is evidently explained by their protonation along the haptaene chain with the formation of the carbonic ion II with a positive charge. Preliminary experiments showed that the protonation reaction is suitable for identification of heptaene antibiotics and apparently is characteristic for the majority of polyene antibiotics.

AD-776 918/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PHYSICOCHEMICAL METHODS OF ANALYZING HYDROMYCIN B,
A. P. Bashkovich, and N. S. Redi. 26 Mar 74, 6p Rept no. FTD-HT-23-949-74
Edited trans. of Nauchno-Issledovatelskii Institut Antibiotikov. Konferentsii Molodykh Uchenykh Leningradskogo Instituta Antibiotikov 2-Y, Leningrad, 4-5 Jun 64. Materialy, n.p., n.d. p9-10, by Dean F.W. Koolbeck.

Descriptors: *Anthelmintics, *Antibiotics, Chemotherapeutic agents, Solvent extraction, Chemical analysis, Physical properties, Purification, Bacteria, USSR, Translations.
Identifiers: Hygromycin B, Streptomyces hygroscopicus.

Hygromycin B is an antibiotic which possesses anthelmintic properties; it is produced simultaneously with another antibiotic - hygromycin A - by a strain of Str. hygroscopicus. Hygromycin B contains two groups of a basic character. In connection with this the separation of hygromycin B from the accompanying antibiotic can be carried out by sorption on cationites with subsequent desorption with aqueous or water-acetone solutions of ammonia or by dilute solutions of acids. To provide rapid evaluation of antibiotic concentration in solutions, the authors made an effort to develop adsorption-spectrophotometric methods of analyzing the antibiotic, working on the basis of the physicochemical properties of the antibiotic and its structural peculiarities.

AD-777 012/6GA PC$3.25/MF$1.45
Rutgers - the State Univ New Brunswick N J Inst of Microbiology
PREPARATION OF PRODIGIOSIN-LIKE PIGMENTS FOR ANTIMALARIAL TESTING.
Final rept. Sep 72-Sep 73,
Nancy N. Gerber. 15 Oct 73, 31p
Contract DADA17-72-C-2033
See also report dated 15 Aug 72, AD-758 178.

Descriptors: *Prodigiosin, *Antimalarials, Actinomyces, Streptomyces, Antibiotics, Chemotherapeutic agents, Organic pigments, Fermentation, Preparation, Bioassay, Mice.
Identifiers: Streptomyces longisporus ruber, Actinomadura madurae.

By fermentation using Streptomyces longisporus ruber 3762 and S. sp. Y-42 the authors prepared and purified 500 mg each of 3 basic pigments for antimalarial testing. One of these and two prepared earlier were active against malaria in mice. (Author)

COM-74-10580/0GA Reprint
Scripps Institution of Oceanography, La Jolla, Calif.
VARIABILIN, AN ANTIBIOTIC FROM THE SPONGE, 'IRCINIA VARIABILIS',
D. John Faulkner. 1973, 4p NOAA-74021325
Pub. in Tetrahedron Letters, n39 p3821-3822 1973.

Descriptors: *Antibiotics, *Porifera, *Aquatic animals, Extraction, Drugs, Staphylococcus, Chromatography, Terpene compounds.
Identifiers: Sea Grant program, Ircinia variabilis, *Variabilin.

The author reports the isolation and structural elucidation of a fourth linear sesterterpene, variabilin 4. A single sample (30 g dry weight) of the sponge, Ircinia variabilis (Schmidt) was shown to contain an ethanol soluble antibiotic, active vs. Staphylococcus aureus. Chromatography of the ether soluble material on silica gel plates gave the pure antibiotic, variabilin 4 in 0.2% yield. The occurance of sesterterpenes in geographically separated species of Ircinia strongly supports the previous taxonomic classification of this sponge. Assuming a normal polyisoprenoid biosynthesis for this series of compounds, variabilin may be regarded as a likely precursor of both the oroidins and fasciculatin.

6P. Physiology

AD-776 555/5GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PRIMARY RESPONSES OF THE AUDITORY CORTEX OF ANESTHETIZED CATS TO SOUNDS OF DIFFERENT INTENSITY (PERVICHNYE OTIVETY SLUKHOVOI KORY NARKOTIZIROVANNYKH KOSHEK NA ZVUKI RAZNOI INTENSIVNOSTI),
O. F. Dembnovetskii. 21 Jun 72, 5p Rept no. FSTC-HT-23-1189-72
Trans. of Zhurnal Vysshei Nervnoi Deyatelinosti (USSR) v17 n1 p154-166 1967.

Descriptors: *Electroencephalography, *Cerebral cortex, *Auditory perception, Sound, Intensity, Anesthesia, Response(Biology), Cats, Experimental data, Translations, USSR.

The following conclusions were drawn from data: Distribution of primary responses (PR) potential along the vertical auditory cortex of anaesthetized cats does not depend on sound intensity or on the polarity of a potential drawn off monopolarly from the surface of the cortex; regular changes in PR (in the latent period and value of phases), depending on sound intensity, is observed only within a narrow range of intensities; the first and second phases of the primary reponse are, evidently, determined by different processes in the mass of the cortex.

AD-776 595/1GA Reprint
North Carolina Univ Chapel Hill Dental Research Center
IN VITRO IMMUNE RESPONSES: EFFECTS OF MASKING LYMPHOCYTE MEMBRANE COMPONENTS,
Marvin L. Tyan. 1 Jun 73, 9p
Contract N00014-67-A-0321-0007
Availability: Pub. in Cellular Immunology, v10 p450-457 1974.

Descriptors: *Immunity, Responses(Biology), Blood cells, Liver, In vitro analysis, Mice, Laboratory animals, Antigen antibody reactions.

Mouse peripheral blood cells and fetal liver cells were cultured with a variety of antigens or with allogeneic cells together with antisera raised against H-2 specificities, or mouse immunoglobulins. All responses dependent upon thymus-passaged cells were profoundly impaired by antisera putatively directed against H-2 specificities. On the other hand, the responses by fetal liver cells (B cells) to these same 'thumus-dependent' antigens or by blood cells from adult mice to 'thymus-independent' antigens were not affected by the same treatment. The heterologous antiserum to mouse immunoglobulins produced a moderate reduction in the responses by blood cells and fetal liver cells to all antigens tested. The AKr-anti-C3H serum either was without effect or it slightly increased the response to these same antigens.

AD-776 637/1GA Reprint
Naval Medical Research Inst Bethesda Md
COMPARISON OF PLASMA BILIRUBIN TURNOVER AND CARBON MONOXIDE PRODUCTION IN MAN.
Medical research progress rept. no. 25,
Paul D. Berk, F. Lee Rodkey, Terrence F. Blaschke, Harold A. Collison, and Jeanne G. Waggoner. 8 Aug 73, 12p
Availability: Pub. in Jnl. of Laboratory and Clinical Medicine, v83 n1 p29-37 Jan 74.

Descriptors: *Bile pigments, *Carbon monoxide, Porphyrins, Catabolism, Liver, Metabolism.
Identifiers: Heme.

Simultaneous measurements of carbon monoxide production (COP) and plasma bilirubin turnover (BRT) were obtained in 37 individuals, whose rates of heme catabolism ranged from normal to approximately nine times normal. It is likely that an appreciable part of this difference can be explained by the small discrepancy between measurements of plasma bilirubin turnover and total bilirubin production which results from the fact that a portion of the bilirubin derived from the degradation of hepatic hemes is excreted directly into the bile without prior passage through plasma. The data cannot rule out the formation of some CO from processes which do not give rise to bilirubin, but suggest that the magnitude of such processes in man must be small. (Modified author abstract)

AD-776 709/8GA Not available NTIS
New York Academy of Sciences N Y
ANNALS OF THE NEW YORK ACADEMY OF SCIENCES. VOLUME 204,
Carlton F. Hazlewood. 30 Mar 73, 633p
Contract N00014-72-C-0128
Proceedings of the International Conference on Physicochemical State of Ions and Water in Living Tissues and Model Systems Held in New York on 10-12 Jan 72.
Availability: Paper copy available from The New York Academy of Sciences, 2 E. 63rd St., New York, N.Y. 10021 $37.50.

Descriptors: *Tissues(Biology), *Biological systems, *Meetings, *Ions, Biophysics, Water, Cytoplasm, Diffusion, Molecular structure, Cells(Biology), Muscles, Models, Ion exchange, Sodium, Potassium, Membranes(Biology).

Theories developed to model cellular function require assumptions about the physical state of ions and water. The most widely accepted theory, termed the membrane theory, describes the living cell as a membranous bag containing liquid water, with the majority of the ions and proteins in free solution. A minority view of cell structure contends that the cell is in an organized nonliquid state, consisting of a matrix of structured water in which are embedded macromolecules (mostly proteins), to which are attached cellular ions such as sodium and potassium. The conference was or-

ganized with two principal aims in mind: first, to achieve a better understanding of the physical state of ions and water in living tissues and model systems; and, second, to have an open and frank discussion of the data and the interpretation of the data.

AD-776 839/3GA PC$3.00/MF$1.45
University of Southern California Los Angeles Dept of Physiology
BLOOD FLOW AND PRESSURE TELEMETRY.
Annual progress rept. 1 Dec 72-30 Nov 73,
C. M. Stevens, and R. D. Rader. 30 Nov 73, 15p
AFOSR-TR-74-0343
Grant AF-AFOSR-2190-72
See also AD-754 997.

Descriptors: *Blood circulation, *Blood pressure, Telemeter systems, Experimental data, Cardiovascular system, Response(Biology), Dogs, Models, Kidneys, Stress(Physiology).
Identifiers: *Biotelemetry.

The major emphasis of this past year's research effort toward characterizing the responses of the cardiovascular system of the military working dog has been to obtain renal hemodynamic information from dogs involved in various stages of obedience, scouting, tracking, and aggression training with technical assistance from Military Working Dog Center personnel. Through the use of a renal model concept developed in this laboratory, intrarenal hemodynamic variations induced by a situational stimuli have been examined. In addition to the major goal of studying cardiovascular responses in dogs, a corollary effort has been to further develop and evaluate the renal model and to continue to improve the reliability of the measurements by improving the reliability of the data acquisition system. As a result of these studies, five papers are in press and two additional manuscripts are being prepared for submission. (Author)

AD-776 927/6GA PC$3.00/MF$1.45
Army Medical Research and Nutrition Lab Denver Colo
CORRELATION OF PLASMA VOLUME AND BODY WEIGHT IN DOGS,
Robert M. Nims, Joseph B. Vacca, Doyce T. Blair, and Paul P. Waring. Sep 73, 22p Rept no.
USAMRNL-342

Descriptors: *Blood plasma, *Body weight, *Blood volume, Correlation techniques, Dogs, Laboratory animals, Statistical analysis, Experimental data, Physiology, Veterinary medicine, Nutrition.

Plasma volumes were determined in 74 experiments on 35 dogs using a T-1824 dye procedure. These values were correlated with body weights in order to examine the relationship and ascertain the reliability of estimating plasma volume from body weight. Further clarification of the relationship was achieved by a comparison with 290 additional plasma volume measurements obtained from the literature. Statistical analyses indicated that the overall data provided the most reliable formula for predicting plasma volume from body weight, but the estimated value contained a potential deviation of plus or minus 244 ml. from the actual value. This variability was not explained by differences in experimental techniques nor measurement error but appeared to be characteristic of the plasma volume/body weight relationship. The total data expressed as plasma volume/kg. body weight approached a normal distribution and indicated that the 'normal range' for plasma volumes in dogs was 34.3 ml./kg. to 69.4 ml./kg. with a mean of 51.8 ml./kg. (Author)

AD-776 948/9GA PC$3.00/MF$1.45
Army Medical Research Lab Fort Knox Ky
ASSESSMENT OF AUDITORY ACUITY, EAR PROTECTION, AND PREDICTION OF HEARING LOSS IN MILITARY PERSONNEL.
Final rept.,
Michel Loeb, George A. Luz, Dennis Sheidler, and Sharon Vanderhei. 31 Oct 73, 10p Rept no.
USAMRL-1067

Descriptors: *Deafness, *Ear protectors, Hearing, Ambient noise, Medical research, Stress(Physiology), Auditory acuity, Predictions, Protective equipment, Rifles, Military personnel, Audiometry, Experimental data, Test methods.
Identifiers: *Hearing loss.

A project currently in progress has three principal purposes: to determine whether the population presently entering military service has hearing within normal limits, to assess the evidence for hearing loss as a function of military experience, and to relate losses to observed utilization of protective devices (e.g., plugs and muffs). Results bearing on the first two questions will be reported elsewhere. In connection with the third objective, this study was primarily concerned with the prediction of hearing loss.

AD-776 952/4GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
INFLUENCE ON THE ORGANIZATIONAL PHASE OF ENDOCRINE FUNCTION EXERTED BY MELATONIN, A CENTRALLY ACTING AGENT.
Technical rept., Aug 72-Mar 73,
George M. Vaughan, and Mary K. Vaughan. Mar 74, 15p Rept no. EB-TR-74001

Descriptors: *Endocrine glands, *Adrenal glands, *Reproduction(Physiology), Inhibition, Growth(Physiology), Reproductive system, Central nervous system, Laboratory animals, Experimental data, Pituitary hormones.
Identifiers: *Melatonin.

A single subcutaneous injection of melatonin to rat or mouse pups on the day of birth inhibited the compensatory ovarian hypertrophy response to unilateral ovariectomy at six weeks of age. The body weights of melatonin-treated female mice were significantly depressed as compared to the body weights of control animals and failed to increase after castration. Compensatory adrenal hypertrophy failed to occur in mice treated with melatonin on the day of birth. Inhibition of ovarian and adrenal compensatory growth was not apparent in mice treated with melatonin on day 17 of life. It is concluded that melatonin may influence the differentiating gonadal and adrenal CNS control centers during the critical neonatal period of organizational endocrine function in the mouse and rat. (Modified author abstract)

LA-5461-PR PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
ENZYME-LABELED ANTIBODY ACTIVITIES. ANNUAL REPORT, JULY 1, 1972--JUNE 30, 1973.
G. C. Saunders. Nov 73, 8p
Contract W-7405-eng-36

Descriptors: (*Antibodies, *Biochemical reaction kinetics), (*Antigen-antibody reactions, *Diagnostic techniques), Cholera, Enzymes, Immune reactions, Labelling, Metabolism, Swine.

For abstract, see NSA 29 07, number 17983.

TT-73-54009/06 PC$4.50
National Library of Medicine, Bethesda, Md.
ACTA PHYSIOLOGICA POLONICA. VOLUME 23, NUMBER 6, 1972.
1973, 123p
The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Physiology, *Periodicals, *Poland, Thyroid gland, Microwaves, Cardiovascular system, Papaverine, Hyperthermia, Glycogens, Brain, Lymphocytes, Catecholamines, Vibration, Noise, Fatty acids, Surgical transplantation, Thermal burns, Leukocytes, Proteins, Digestion(Biology), Amino acids, Metabolism, Vitamin B complex, Pancreatitis, Conditioned responses, Arterial pulse, Translations.

Contents;
- Mechanism of the reflectory changes in cardiac rhythm in papaverine treated dogs;
- Glycogen concentration in the brain stem of mice in hyperthermia;
- Studies on the proteolytic activity of lymphocytes in transplantation response;
- Studies on the behavior of some lysosomal enzymes of rabbit leukocytes in combustion disease;
- Functional and morphological studies of the thyroid gland in animals exposed to microwave irradiation;
- Effect of vibration on the content of catecholamines;
- Effect of noise on the level of free fatty acids in the blood;
- Effect of protein-free diet on protein digestion;
- Effect of oral and cutaneous administration of biotin on the dynamics of fur growth in rats;
- Device for the fixation of kymograms.

6Q. Protective Equipment

AD-776 354/3GA PC$3.75/MF$1.45
Uniroyal Inc Naugatuck Conn
LIGHTWEIGHT INSULATED FOOTWEAR FOR COLD-WET CONDITIONS.
Final rept. Nov 71-Nov 72,
T. A. Pietraszek. Dec 73, 73p USA-NLABS-TR-74-10-CE, C/PLSEL-119
Contract DAAG17-72-C-0058

Descriptors: *Footwear, Clothing, Fabrication, Low temperature.
Identifiers: Design.

The objective was to fabricate 450 pair, 150 pair each in sizes 8, 9 and 10 of lightweight, insulated polyurethane footwear utilizing and updating all previous knowledge developed on this item. Work was directed toward the following goals: Development of a new puncture resistant skin; increasing thickness of outerskin below the ankle; modifying processing techniques for an improved skin; improvement in adhesion of outerskin to boot proper; modifying closure to improve wearability; eliminating bloom on boot surfaces upon storage; preparing preproduction samples; and developing a ski-shelf and groove in heel design for application to this footwear.

AD-776 358/4GA PC$4.00/MF$1.45
Uniroyal Inc Middlebury Conn
LIGHTWEIGHT (COLD-DRY) INSULATED FOOTWEAR.
Final rept. Jan 71-Feb 73,
E. J. Kopka. Jul 73, 90p USA-NLABS-TR-74-11-CE, C/PLSEL-120
Contract DAAG17-71-C-0070

Descriptors: *Footwear, Clothing, Fabrication, Low temperature, Materials.

An upper boot foam and outsole foam were developed for a non-discoloring, cold-dry, off-white combat boot. The urethane foam used is flexible down to -45F, closed-cell, and lightweight. Computerized studies were conducted to evaluate materials (polyols, isocyanates, and chain extenders) and formulations. To fabricate the boot parts, liquid-injection molding type equipment was used. Four pair of prototype footwear were fabricated. (Author)

N74-16844/4GA PC$7.75/MF$1.45
ILC Industries, Inc., Dover, Del.
DEVELOPMENT OF EMERGENCY INTRAVEHICULAR SPACESUIT (EIS) ASSEMBLY.
Final Report.
17 Oct 73, 95p NASA-CR-134191, ER-852-29

Contract NAS9-12995

Descriptors: *Equipment specifications, *Extravehicular activity, *Space suits, Bioengineering, Emergency life sustaining systems, Manned space flight, Pressure suits.

For abstract, see STAR 1208

PB-230 219/8GA PC$4.75/MF$1.45
Army Land Warfare Lab., Aberdeen Proving Ground, Md.
EVALUATION OF AN ALL-PURPOSE COMMUNICATION/PROTECTIVE HELMET.
Final rept.,
Matthew J. Wargovich, and Martin L. Lonky. Aug 73, 34p

Descriptors: *Helmets, *Headgear, *Protective mask facepieces, Evaluation, Field tests, Communication equipment, Questionnaires, Police, Projectiles, Gasoline, Hydrochloric acid, Impact tests, Ballistics, Radio communication, Protective masks.

The communication/protective helmet system consisted of a helmet with face shield and transducer/receiver, a neck protector, a radio, and a gas mask, to be used by police. Ten of these equipment sets were laboratory tested and forty sets were tested by potential users under actual field conditions. Laboratory testing consisted of determining the effects of projectiles, hydrochloric acid, flaming gasoline, and low velocity mechanical impact on the protective assembly. Field testing evaluations emphasized comfort, ease of use, and intelligibility of radio reception and transmission. The law enforcement organizations participating in the field testing phase of this project include: the Maryland State police, the city of Miami police, the city of Detroit police, and the city of Boston police. Laboratory, and field test results are presented and discussed. Appended material includes the questionnaire used in the field testing and ballistic test data.

6R. Radiobiology

AD-776 528/2GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
THE BIOLOGICAL EFFECT OF ELECTROMAGNETIC FIELDS.
V. B. Shneivas, and K. A. Zufarov. 21 Dec 73, 6p
Rept no. FSTC-HT-23-323-72
Trans. of Meditsinskii Zhurnal Uzbekistana (USSR) n6 p12-15 Jun 68, by Albert L. Peabody.

Descriptors: *Radiation effects, *Electromagnetic fields, Liver, Mitochondria, Cells(Biology), Electron microscopy, Rats, Experimental data, USSR, Translations.

The results of electron microscope studies of the effects of nonthermal electromagnetic fields at radio frequencies on the subcellular structures of the rat liver are presented. Differences in reaction of subcellular structures to electromagnetic fields as a function of frequency are described. (Author)

AD-776 622/3GA Reprint
Armed Forces Inst of Pathology Washington D C
DELAYED BRAIN SWELLING AND FUNCTIONAL DERANGEMENT AFTER X-IRRADIATION OF RIGHT VISUAL CORTEX IN THE 'MACACA MULATTA',
William F. Caveness, Akira Tanaka, Kenneth H. Hess, Thomas L. Kemper, and Mark O. M. Tso. 26 May 73, 19p
Availability: Pub. in Radiation Research, v57 p104-120 1974.

Descriptors: *Radiation effects, *Brain, *X rays, Radiation dosage, Cerebral cortex, Pathology, Vision, Monkeys, Experimental data.
Identifiers: Macaca mulatta, *Visual evoked responses.

Thirteen monkeys with catheter reservoir systems for cerebral spinal fluid pressure measurements were exposed to 3500 rads of x-irradiation at 250 kVp, 30 mA, in a single dose to the right visual cortex. In eight, there was abrupt brain swelling 18-36 weeks after irradiation, reflected by cerebral spinal fluid pressure 3-4 times baseline, with absence of visual evoked response and behavioral blindness in four, and unilateral visual evoked response depression in the other four. Seven monkeys, sacrificed between 20 and 36 weeks, showed proliferative and degenerative changes in the right occipital lobe which was deeply stained with dye. The swelling extended throughout the right hemisphere with distortion in brain structures. One sacrificed at 52 weeks, after resolution of increased pressure, had a fibrotic, nonstained occipital lesion with atrophic changes in both hemispheres. In five there were less pronounced functional and structural changes. Two nonirradiated controls remained within normal limits. (Modified author abstract)

AD-776 821/1GA PC$3.75/MF$1.45
Washington Univ Seattle
ELECTROMAGNETIC POWER DEPOSITION IN MAN EXPOSED TO HIGH-FREQUENCY FIELDS AND THE ASSOCIATED THERMAL AND PHYSIOLOGIC CONSEQUENCES.
Interim rept. 21 Aug 72-18 Jan 73,
Arthur W. Guy, Curtis C. Johnson, James C. Lin, Ashley F. Emery, and Kenneth K. Kraning. Dec 73, 71p SAM-TR-73-13
Contract F41609-73-C-0002

Descriptors: *Radiation effects, *Electromagnetic radiation, High frequency, Response(Biology), Stress(Physiology), Humans, Experimental data, Heat stress(Physiology), Electrodynamics, Mathematical models, Blood circulation, Respiration, Skin(Anatomy).

The purpose of the work is to develop an electrodynamic equation of state for man adequate to describe power deposition in humans exposed to high-frequency (HF) electromagnetic fields. Further, the dissipation of this deposited energy by known models of thermal transfer is to be utilized to predict physiologic responses and burdens of persons so exposed. Because several thermal models are extant which have been shown to correlate with experimental observation, the authors began by adding radio frequency (RF) power as a thermal load in these equation sets (sections II and III). Electromagentic equations of state are developed in section IV, followed by prediction of power transfer from fields in section V. The head, as a special case, is treated in section VI, and initial attempts to develop a more realistic electrodynamic model are described in section VII.

AD-777 019/1GA PC$3.25/MF$1.45
Virginia Commonwealth Univ Richmond Dept of Biophysics
EFFECTS OF LOW INTENSITY MICROWAVE RADIATION ON MAMMALIAN SERUM PROTEINS.
Annual summary rept. no. 1,
Stephen F. Cleary, and Robert T. Wangemann. Jun 73, 46p
Contract DADA17-72-C-2144

Descriptors: *Radiation effects, *Proteins, Blood serum, Microwaves, Blood chemistry, Pathology, Sleep, Experimental data, Kidney diseases, Tissues(Biology), Rabbits, Low intensity.
Identifiers: *Microwave radiobiology.

The effect of 2.45 GHz continuous wave and pulsed wave radiation on serum proteins, blood chemistry and tissue pathology have been investigated during the past year. Changes in serum proteins were detected by the use of acrylamide gel electrophoresis which appear to be related to microwave exposure. Microwave irradiation at an intensity of 25 mW/sq cm for two hours resulted in significant increases in blood urea nitrogen (BUN), glucose, uric acid, cholesterol, and serum glutamic oxaloacetic transaminase. A dose response relationship was found for the effect of 2.45 GHz microwave exposure on pentobarbital-induced sleeping times in the Dutch rabbit and the maximally effective intensity was 15 mW/sq cm, which produced an 80% reduction in sleeping times. Tissue pathology and histopathology of rabbits irradiated at 25 mW/sq cm suggested that the primary effect of such exposure was nephrosis. (Modified author abstract)

AD-777 032/4GA PC$4.25/MF$1.45
Armed Forces Radiobiology Research Inst Bethesda Md
BONE MARROW RESPONSE OF BEAGLES TO FRACTIONATED DOSES OF MIXED GAMMA-NEUTRON RADIATION.
Scientific rept.,
J. E. West, F. A. Mitchell, S. R. Jones, and J. Witz. Sep 73, 23p Rept no. AFRRI-SR73-15

Descriptors: *Radiation effects, *Bone marrow, Gamma rays, Dogs, Laboratory animals, Experimental data, Dose rate, Radiation dosage, Sublethal dosage, Lethality.

Male beagles were bilaterally exposed to mixed gamma-neutron radiation from the AFRRI-TRIGA reactor. The dose rate was 20 rads/minute for all irradiations and midline tissue doses were 215 rads, 225 rads and 240 rads. At each dose approximately one-half of the animals received a single irradiation while the others were given one-fourth the dose each day for 4 consecutive days. The objective of this study was to determine if doses in the median lethal range delivered in four equal fractions at 24-hour intervals were more lethal and more damaging to survival-limiting hematopoietic cell renewal systems than similar unfractionated doses. Single irradiations were the more lethal, first evident at 225 rads and increasing markedly in effectiveness at 240 rads. Radiation-induced changes in bone marrow cellularity were similar after single and fractionated irradiations. (Modified author abstract)

AD-777 033/2GA PC$3.00/MF$1.45
Armed Forces Radiobiology Research Inst Bethesda Md
MEASUREMENT OF CANINE INTESTINAL CAPILLARY BLOOD FLOW IN THE TERMINAL PHASE OF THE GASTROINTESTINAL RADIATION SYNDROME.
Scientific rept.,
J. Kabal, L. J. Parkhurst, and D. E. Wyant. Nov 73, 15p Rept no. AFRRI-SR73-18

Descriptors: *Radiation effects, *Gastrointestinal system, *Blood circulation, Whole body irradiation, Dogs, Laboratory animals, Experimental data, Cardiovascular system, Radiation injuries, Blood vessels, Stress(Physiology).
Identifiers: *Gastrointestinal radiation syndrome.

The objective of the study was to test a method of measuring the distribution of intestinal capillary blood flow. Adult male beagles were divided into two groups, one of which was sham irradiated while the other was subjected to 1500 rads of whole-body pulsed gamma-neutron radiation. Seventy-two hours postirradiation, radioactive-tagged microspheres were injected directly into the left ventricle of the heart. The results showed that the intestinal capillary blood flow (in percent of cardiac output) of the irradiated dogs was higher than that of the nonirradiated dogs. Although the weight of the mucosal layer of the small intestine decreased significantly postirradiation, its relative capillary blood flow remained at the preirradiated level, indicating increased capillary blood flow per unit weight of mucosa. The method was successfully applied to the measurement of mucosal flow as a function of cardiac output and can be applied to the study of the pathophysiology of a variety of stresses including irradiation. (Modified author abstract)

BNL-18401 PC$3.50/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
COMPARATIVE EVALUATION OF EXP 123 I AND /SUP 99M/TC FOR THYROID STUDIES.
H. L. Atkins, A. N. Ansari, P. R. Bradley-Moore, R. Lambrecht, and A. Wolf. 1973, 26p CONF-740203-1

Descriptors: (*Thyroid, *Radionuclide kinetics), (*Iodine 123, *Metabolism), (*Technetium 99, Metabolism), Comparative evaluations, Cost, Images, Isomeric nuclei, Patients, Tracer techniques.

For abstract, see NSA 29 07, number 16054.

CEA-R-4483 PC$7.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
CONTRIBUTION TO THE STUDY OF THE RADIOPROTECTIVE EFFECT OF SEROTONIN ON BRAIN SPONTANEOUS AND EVOKED ELECTRICAL ACTIVITIES IN THE ADULT RABBIT FOLLOWING WHOLE-BODY LETHAL GAMMA -IRRADIATION.
M. Fatome, and L. Court. Nov 73, 103p
In French. U.S. Sales Only.

Descriptors: (*Brain, *Electric currents), (*Serotonin, *Radiosensitivity effects), Biological radiation effects, Central nervous system, Gamma radiation, Photon beams, Rabbits, Radiation protection, Response modifying factors.

For abstract, see NSA 29 07, number 15985.

COO-1632-35 PC$3.00/MF$1.45
Kansas Univ., Kansas City (Usa). Medical Center.
MECHANISMS OF IMMUNOSUPPRESSION AND CELLULAR MECHANISMS OF SECONDARY DISEASE. FINAL REPORT, SEPTEMBER 1, 1971--AUGUST 31, 1973.
E. M. Uyeki. 1973, 6p
Contract AT(11-1)-1632

Descriptors: (*Animal cells, *Antibody formation), (*Immune reactions, *Biological radiation effects), (*Drugs, *Biological effects), (*Antibiotics, Biological effects), Diseases, Immunosuppression, In vitro, In vivo, Phenothiazines, Purines, Puromycin, Radiations.

For abstract, see NSA 29 07, number 15841.

FRNC-TH-408 PC$8.00/MF$1.45
Bordeaux-1 Univ., 33 (France).
EFFECTS OF ACUTE AND SUB-ACUTE GAMMA RADIATION ON PHOTOSYNTHETIC RELEASE AND RESPIRATION OF THREE UNICELLULAR MARINE ALGAE.
J. P. Ehrhardt. 1973, 119p
In French. U.S. Sales Only.

Descriptors: (*Photosynthesis, *Inactivation), (*Respiration, *Inhibition), (*Algae, *Biological radiation effects), Acute irradiation, Chloroplasts, Delayed radiation effects, Dose-response relationships, Gamma radiation, Mitochondria, Photon beams.

For abstract, see NSA 29 07, number 15911.

LBL-2448 PC$4.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
REPORT OF THE BIOASSAY LABORATORY, JULY 1972 THROUGH JUNE 1973.
C. T. Schmidt, T. W. Sargent, D. J. Yaeger, and A. deG. Low-Beer. Nov 73, 18p
Contract W-7405-eng-48

Descriptors: (*Lawrence berkeley laboratory, *Personnel dosimetry), (*Personnel, *Whole-body counting), (*Urine, *Radiometric analysis), (*Carbon 14, *Retention), Beta sources, Internal irradiation, Radiation doses, Radiation monitoring, Radiation protection, Radionuclide kinetics, Sampling, Tritium, Uptake.

For abstract, see NSA 29 07, number 16048.

N74-17214/9GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE PATHOGENIC ACTION OF QUANTUM GENERATORS (LASERS).
V. V. Shikhodyrev, P. D. Gorizontov, and N. N. Sirotinin. Feb 74, 20p NASA-TT-F-15326
Contract NASW-2485
Tran-Transl. Into English from the Book "Patologicheskaya Fiziologia Extremalnykh Sostoyanie" Moscow, Meditsina Press, 1973 p 370-380.

Descriptors: *Irradiation, *Retina, *Tissues (Biology), *Wavelengths, Lasers, Pathological effects.

For abstract, see STAR 1208

ORNL-TM-4369 PC$5.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
CALCULATIONS RELATED TO THE USE OF PHOTONS, NEUTRONS, NEGATIVELY CHARGED PIONS, PROTONS, AND ALPHA PARTICLES IN CANCER RADIOTHERAPY.
R. G. Jr. Alsmiller, R. T. Santoro, T. W. Armstrong, J. Barish, and K. C. Chandler. Jan 74, 69p
Contract W-7405-eng-26

Descriptors: (*Photons, *Radiation doses), (*Neutrons, Radiation doses), (*Pions minus, Radiation doses), (*Protons, Radiation doses), Alpha particles, Kidneys, Let, Neoplasms, Phantoms, Radiation transport, Radiotherapy, Tissues.

For abstract, see NSA 29 07, number 17455.

ORNL-TM-4411 PC$6.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
MEASUREMENT OF ABSORBED FRACTIONS FOR PHOTON SOURCES DISTRIBUTED UNIFORMLY IN VARIOUS ORGANS OF A HETEROGENEOUS PHANTOM.
S. M. Garry, P. S. Stansbury, and J. W. Poston. Jan 74, 76p
Contract W-7405-eng-26

Descriptors: (*Phantoms, *Internal irradiation), (*Gamma radiation, *Radiation dose distributions), Gamma sources, Organs, Photons, Radiation doses, Radiation source implants, Radiation sources.

For abstract, see NSA 29 07, number 17456.

PB-230 017/6GA
Mag Tape $97.50;Foreign $122.50
Bureau of Radiological Health, Rockville, Md. Office of Data Systems and Mathematics.
DSMS UPDATE PROGRAM. 1969, MODIFIED PERIODICALLY.
Data file,
William Pakenas. 19 Jun 73, 1 reel mag tape
FDA/DF-73-009
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Computer programs, *Information systems, *Radiobiology, Data storage.

A program is designed to update files by adding, deleting, or changing records on those files. In addition, records can be sequence-numbered and/or selected from the master file to create another file. Parameters defining the physical characteristics of the file and those defining control fields are coded onto control cards.

PB-230 701/9GA PC-GPO/MF$1.45-NTIS
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A LIMITED SURVEY OF HEALTH-RELATED LASER CHARACTERISTICS FOR SELECTED APPLICATIONS IN THE UNITED STATES,
W. R. Payne, and R. W. Peterson. Jan 74, 55p*
DHEW/FDA-74-8016
Paper copy available from GPO $0.95 as Stock no. 1715-00069.

Descriptors: *Health physics, *Lasers, Equipment, Instrumentation, Exposure, Safety engineering, Performance standards, Warning systems, Surveys.
Identifiers: *Laser radiobiology.

In 1972 a study of the performance characteristics and use conditions of laser products was carried out at selected operational sites in high schools, colleges, and universities, and industrial construction areas in seven States. This study was performed in order to gather engineering data in support of the development of a safety performance standard for laser products. Data obtained for the 288 lasers found at the 108 installations surveyed indicated serious shortcomings in laser safety within the United States at the present time. This report describes the methodology and instrumentation used for the survey and presents an analysis and evaluation of the data obtained.

TT-73-53043 PC$25.75/MF$1.45
Agricultural Research Service, Washington, D.C.
THE GENETIC AND PHYSIOLOGICAL EFFECTS OF THE ACTION OF ULTRA-VIOLET RADIATION ON HIGHER PLANTS,
A. P. Dubrov. 1974, 45p
Trans. of mono. Geneticheskie i Fiziologicheskie Effekty Deistviya Ultrafioletovoi Radiatsii na Vysshie Rasteniya, Moscow, 1968 250p, by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Plants(Botany), *Ultraviolet radiation, *Radiation effects, Plant physiology, Plant genetics, Plant chemistry, USSR, Translations.

The book deals with the role of ultra-violet radiation in the life activity of higher plants. Reported are the characteristics of genetical and physiological effects of ultra-violet radiation, functional biochemical changes, and the molecular basis in the process of damage and restoration. The importance of ultra-violet radiation and photo-reactivation in the evolution of plant forms, and also the practical application of ultra-violet radiation in farming are discussed.

UCSF-10-P-2-219 PC$3.50/MF$1.45
California Univ., San Francisco (Usa).
TIME-DOSE RELATIONSHIPS IN THE MOUSE ESOPHAGUS.
T. L. Phillips, and G. Ross. 1973, 28p CONF-731123-2

Descriptors: (*Radiation injuries, *Dose-response relationships), (*Esophagus, *Biological radiation effects), Chest, Fractionated irradiation, Lethal radiation dose, Mice, Pathology, Photon beams, Time dependence, X radiation.

For abstract, see NSA 29 07, number 15986.

6S. Stress Physiology

AD-776 670/2GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
EFFECT OF 30-DAY EXPOSURE TO IMPULSIVE NOISE ON BODY MOVEMENTS DURING SLEEP,
A. Muzet, P. Naitoh, L. C. Johnson, and R. E. Townsend. 1973, 4p Rept no. NMNRU-74-8
Availability: Pub. in Sleep: Physiology, Biochemistry, Psychology, Pharmacology, Clini-

cal Implications. Proceedings of European Congr. Sleep Research (1st), Basel 1972, p412-413 1973.

Descriptors: *Sleep, *Impulse noise, Medical research, Electroencephalography, Rapid eye movement in sleep, Experimental data.
Identifiers: Body movements.

Ten young adult males were exposed to impulsive noise given every 22 seconds, 24 hours a day, over a 30-day period. In addition to electroencephalography and autonomic data, body movements during stage two and rapid eye movement were measured to determine the effects of the noise on motility during sleep. The impulsive noise redistributed or regulated the appearance of the body movements to the proximity of the noise, but did not increase the total number of body movements during sleep which appeared to be under endogenous control. (Author)

AD-776 701/5GA Reprint
Wayne State Univ Detroit Mich Biomechanics Research Center
STRUCTURAL CONSIDERATIONS OF THE HUMAN VERTEBRAL COLUMN UNDER +GZ IMPACT ACCELERATION,
Albert I. King, Priyaranjan Prasad, and Channing L. Ewing. 3 Sep 71, 13p NAMRL-1178
Contract N00014-69-A-0235
Errata sheet inserted. Revision of report dated 12 May 71. Presented at the AIAA Aerospace Sciences Meeting (9th) Held in New York 25-27 Jan 71, Paper 71-144.
Availability: Pub. in Jnl. of Aircraft, v9 n1 p84-90 Jan 72.

Descriptors: *Spinal column, *Impact acceleration, *Biomechanics, *Biodynamics, Cadavers, Wounds and injuries, Force(Mechanics), Stress(Physiology), Acceleration tolerance, Bone fractures.

Among the major limitations on manned aerospace vehicular-and-escape-system designs are the structural limits of the human body. One of the lower limits is the strength of the vertebral body under +Gz (eyeballs down) impact acceleration. When the vertebral column is considered as a structural member, a finite limit on non fracturing accelerations can be specified, as has previously been the case. An hypothesis as to the mechanism of fracture, which suggests an approach capable of raising the limit, and experimental evidence in support of the hypothesis are presented. A crude device based upon the approach was designed and tested experimentally on cadaveric exposures to +Gz acceleration. A statistically significant increase in the level of acceleration required to cause fracture was measured. (Author)

AD-776 829/4GA Reprint
School of Aerospace Medicine Brooks AFB Tex
DECOMPRESSION SICKNESS IN SIMULATED APOLLO-SOYUZ SPACE MISSIONS,
Julian P. Cooke, and William G. Robertson. 1974, 6p Rept no. SAM-TR-73-287
Availability: Pub. in Aerospace Medicine, p297-300 Mar 74.

Descriptors: *Decompression sickness, *Aerospace medicine, Spacecraft, USSR, Pressure suits, Aerospace environment, Altitude, Oxygen, Nitrogen, Mixtures.
Identifiers: Denitrification, *Apollo Soyuz test project.

Apollo-Soyuz docking module atmospheres were evaluated for incidence of decompression sickness in men simulating passage from the Russian spacecraft atmosphere to the American space suit pressure. Following eight hours of 'shirtsleeve' exposure to 31:69::O2:N2 gas breathing mixture, at 10 psia, subjects were 'denitrogenated' for either 30 or 60 minutes with 100% O2 prior to decompression directly to 3.7 psia suit equivalent while performing exercise at fixed intervals. Five of 21 subjects experinced symptoms of decompression sickness after one hour of denitrogenation compared to 6 among 20 subjects after 30 minutes of denitrogenation. A condition of Grade I bends was reported after one hour of denitrogenation and 3 of these 5 subjects noted the disappearance of all symptoms of bends at 3.7 psia. After 30 minutes of denitrogenation, 2 out of 6 subjects developed Grade II bends at 3.7 psia. After one hour denitrogenation time is considered necessary for decompression from 10 psia to a space suit pressure of 3.7 psia. (Author)

AD-776 834/4GA Reprint
Scottish Marine Biological Association Edinburgh Oceanographic Lab
THE INFLUENCE OF ETHYL ALCOHOL INGESTION ON A TARGET TASK DURING SUSTAINED +GZ CENTRIFUGATION,
R. R. Burton, and J. L. Jaggars. 1974, 9p Rept no. SAM-TR-73-306
Availability: Pub. in Aerospace Medicine, p290-296 Mar 74.

Descriptors: *Acceleration tolerance, *Vestibular apparatus, Alcohols, Response(Biology), Ingestion(Physiology), Performance(Human), Experimental data, Heart, Nystagmus, Proprioception, Coriolis effect, Performance(Human).
Identifiers: *Alcohol ingestion, Ethyl alcohol, Breath examiners.

Little information is available regarding the effects of alcohol combined with sustained G. Browne observed that alcohol decreased blackout tolerance and increased the incidence of nausea and disorientation occasionally associated with centrifugation-human performance, however, was not measured in this experiment. Considering the lack of knowledge in this area and the possibility of a synergistic decrease in human capability during exposure to increased G after alcohol ingestion, experiments were performed and the results are reported.

AD-776 886/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE QUESTION OF SHIFTS IN THE INDICES IN THE PROTEIN METABOLISM OF CONCRETE WORKERS SUBJECTED TO THE EFFECT OF GENERAL VIBRATION,
G. I. Rumyantsev, and A. M. Tambovtseva. 8 Mar 74, 9p Rept no. FTD-HT-23-1030-74
Edited trans. from Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p53-55 1968, by Bernard L. Tauber.

Descriptors: *Protein metabolism, *Vibration, Industrial medicine, Personnel, Reinforced concrete, Proteins(Simple), Blood serum, USSR, Translations, Albumins, Globulins, Stress(Physiology).

The question of changes in protein metabolism with the effect of vibration has not been sufficiently studied. Of the published works devoted to the problem of vibration, the authors first present the studies of M. I. Kuznetsov, Yu. F. Udalov, and N. P. Chelnokov (1959). The authors point to a reduction in the excretion of creatinine with the action of mechanical vibrations which, in their opinion, is caused by the effect of vibration on protein metabolism. The study was conducted to determine the content of serum protein of workers subjected to the effect of general vibration in the production of precast reinforced concrete. One hundred ninety-one workers were investigated to study the nature of the shifts on the part of protein metabolism.

JPRS-61376 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
EFFECTS OF INCREASED PARTIAL PRESSURE OF OXYGEN ON THE SYMPATHO-ADRENAL AND ACETYLCHOLINE SYSTEMS,
N. S. Eremeev, G. V. Troshikhin, and V. G. Shalyapina. 1 Mar 74, 9p
Trans. of Fiziologicheskii Zhurnal SSSR, v58 n5 p768-772 1972.

Descriptors: *Hyperoxia, *Norepinephrine, *Acetylcholinesterase, *Hyperbaric oxygenation, Corticasteroids, Brain, Stress(Physiology), Biochemistry, Blood plasma, Mice, Experimental data, USSR, Translations.
Identifiers: Neurochemistry.

The report contains results of experiments conducted with male white mice to determine the concentrations of norepinephrine and acetylcholinesterase activity in brain tissue and plasma levels of corticosteroids following 10 days of exposure to hyperoxic environment as well as the levels of NE and CS after two hours of exposure to oxygen at pressures of 1, 3 and 3.5 atmospheres.

N74-16821/2GA PC$4.50/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE PATHOGENIC EFFECT OF ELECTRICAL CURRENT.
G. L. Frenkl, K. A. Azhibayev, I. K. Mishchenko, P. D. Gorizontov, and N. N. Sirotinin. Feb 74, 27p NASA-TT-F-15319
Contract NASW-2485
Tran-Transl. Into English from the Book "Patologicheskaya Fiziologiya Ekstremal'Nykh Sostoyaniy" Moscow, Meditsina Press, 1973 p 145-159.

Descriptors: *Electric current, *Pathogenesis, *Pathological effects, Alternating current, Death, Electric potential, Electrical resistance, Prophylaxis, Resuscitation.

For abstract, see STAR 1208

N74-16823/8GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
CHANGE IN RESPIRATION OF RAT LIVER MITOCHONDRIA DURING PROLONGED HYPOKINESIS.
L. N. Grinberg. Feb 74, 9p NASA-TT-F-15386
Contract NASW-2485
Tran-Transl. Into English from Vop. Med. Khim. (Moscow), V. 16, 1970 p 387-390.

Descriptors: *Hypokinesia, *Liver, *Mitochondria, *Respiratory rate, Aerospace medicine, Cells (Biology), Enzyme activity, Oxygen metabolism, Rats.

For abstract, see STAR 1208

N74-16824/6GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
CHANGES IN THE GAS METABOLISM, GAS HOMEOSTASIS AND TISSUE RESPIRATION IN THE RAT DURING PROLONGED HYPOKINESIS.
V. L. Popkov, E. S. Mailyan, Y. S. Galushko, Y. A. Kovalenko, and Y. I. Zaytseva. Feb 74, 11p NASA-TT-F-15393
Contract NASW-2485
Tran-Transl. Into English from Fiziol. Zh. Sssr (Moscow), V. 56, No. 12, 1970 p 18-08-1812.

Descriptors: *Hypokinesia, *Metabolism, *Rats, *Respiration, *Tissues (Biology), Biological effects, Physical work, Work capacity.

For abstract, see STAR 1208

N74-16825/3GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE MECHANISM OF DEVELOPMENT OF AORTIC ANEURYSM IN RABBITS DURING LIMITATION OF THEIR MOBILITY.
V. V. Tyavokin. Feb 74, 10p NASA-TT-F-15397
Contract NASW-2485
Tran-Transl. Into English from Kardiologiya (Ussr), V. 12, Sep. 1972 p 139-143.

Descriptors: *Aorta, *Mobility, *Rabbits, *Stretching, Abdomen, Clinical medicine, Constrictions, Thorax.

For abstract, see STAR 1208

N74-16828/7GA PC$4.25/MF$1.45
Defence Research Information Centre, Orpington (England).
DEEP DIVING WITH SYNTHETIC MIXTURES OF GASES.
A. Zetterstroem. Nov 73, 22p DRIC-TRANS-3386, BR30684
Tran-Transl. Into English from Tex. Tidsskr. (Stockholm), No. 75, 1945 p 173-178.

Descriptors: *Diving (Underwater), *Gas mixtures, *Human reactions, *Pressure breathing, Decompression sickness, Helium, Hydrogen, Narcosis, Nitrogen, Oxygen, Physiological responses.

For abstract, see STAR 1208

6T. Toxicology

AD-776 831/0GA Reprint
Navy Toxicology Unit Bethesda Md
A COMPARISON OF THE TOXICOLOGY OF TRIETHYLENE GLYCOL DINITRATE AND PROPYLENE GLYCOL DINITRATE,
Melvin E. Anderson, and Raymond G. Mehl. 28 May 73, 7p
Availability: Pub. in American Industrial Hygiene Association Jnl., p526-532 Dec 73.

Descriptors: *Glycols, *Toxicology, *Industrial medicine, Explosives, Hazards, Hypotension, Laboratory animals, Bioassay, Lethal dosage.
Identifiers: *Propane diol/dinitrate, *Triethylene glycol/dinitrate, Methemoglobinemia.

In most species the LD50 of triethylene glycol dinitrate (TEGDN) is two to five times as high as that of propylene glycol dinitrate (PGDN). Both compounds produce methemoglobinemia and hypotension in rats. However, TEGDN-poisoned rats tremor violently and expire, apparently in respiratory arrest, after acute convulsive episodes. PDGN-poisoned rats are lethargic and do not convulse. In vitro TEGDN at concentrations above 1.5mM blocks nerve-stimulated contraction of a phrenic nerve-diaphragm preparation, and this interference with nerve-muscle communication appears to be the cause of the tremoring. Chronic daily dermal applications to rabbits of 21 mmoles/kg of both dinitrates cause death in 2 to 3 weeks. PGDN-treated rabbits gain weight normally, while those treated with TEGDN lose 20 to 30% of their body weight. Guinea pigs receiving as little as 100 mg/kg of TEGDN ip daily have decreased food intake and retarded weight gain. The toxic responses to these two dinitrates are therefore sufficiently different to preclude simple comparisons in hazard evaluations. (Author)

7. CHEMISTRY

7A. Chemical Engineering

AD-776 562/1GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
HEAT AND MASS TRANSFER DURING THE ATOMIZATION OF LIQUID,
B. I. Leonchik, and A. A. Dolinskii. 4 Jan 74, 6p
Rept no. FSTC-HT-23-2550-72
Trans. of Tepolo i Massoperenos (USSR) v11 p899-902 1969.

Descriptors: *Heat transfer, *Mass transfer, *Atomization, Liquids, Meetings, USSR, Translations.
Identifiers: *Spray drying, Process engineering.

Several papers on the thermal dehydration of liquids - liquids in dispersed state, presented in the All-Union Conference on Heat and Mass Transfer, are reviewed. Problems of the analysis and design of the processes of heat and mass exchange during spray drying are defined.

AD-776 617/3GA PC$6.50/MF$1.45
Little (Arthur D) Inc Cambridge Mass
ASSESSMENT MODELS IN SUPPORT OF THE HAZARD ASSESSMENT HANDBOOK.
Technical rept.,
Phani P. K. Raj, and Ashok S. Kalelkar. Jan 74, 253p* Rept no. ADL-74685-40 USCG-D-65-74
Contract DOT-CG-24655-A

Descriptors: *Hazards, *Chemicals, *Water pollution, *Handbooks, Air pollution, Mathematical models, Spilling, Flow charting, Vapors, Fire hazards, Tanks(Containers), Rupture, Fluid flow.
Identifiers: *Hazardous materials transportation.

Analytical models are derived to describe the hazards caused by the accidental release of chemicals into the atmosphere or spills onto water. The models encompass a variety of physical phenomena that can occur such as dispersion of vapor in the atmosphere, dispersion of liquid in water, spreading on water, burning of a liquid pool, radiation from flame, etc. Analyses include the modeling of the phenomenon, solution to the governing equations, and detailed workings of specific examples. (Author)

AD-776 687/6GA Reprint
California Inst of Tech Pasadena Dept of Applied Mathematics
MULTIPLE SOLUTIONS AND PERIODIC OSCILLATIONS IN NONLINEAR DIFFUSION PROCESSES,
Donald S. Cohen. 7 Dec 72, 17p AROD-7625.30-M
Contract DAHC04-68-C-0006, Grant NSF-GP-18471
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v25 n4 p640-654 Dec 73.

Descriptors: *Chemical engineering, Mathematical models, Diffusion, Nonlinear differential equations, Partial differential equations.
Identifiers: *Chemical reactors, Bifurcation theory, Parabolic differential equations.

The author studies the oscillatory stationary states in the temperature and concentration fields occurring in tubular chemical reactors. Singular perturbation and multitime scale procedures are combined formally to clearly and simply reveal the mechanism controlling these oscillatory states. Their stability is also studied, and when coupled with previously obtained results on multiple steady states, this information completes the response (bifurcation) diagram in one-parameter range of the tubular reactor. The results apply also to more general nonlinear parabolic problems of which the first order tubular reactor is a special case. (Author)

PAT-APPL-435 791 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
METHOD OF PREPARING BIPOLAR MEMBRANES AND THE PRODUCTION OF ACIDS AND BASES THEREFROM.
Patent Application,
Milton S. Mintz. Filed 23 Jan 74, 9p
DOCKET/SAL-1994
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, Production, Fabrication, Plastic coatings, Electrodialysis, Ion exchange resins, Electrolysis, Inorganic acids.
Identifiers: *Bipolar membranes.

The patent application describes a method for preparing bipolar membranes by depositing a coating of an ion exchange resin on a conventional ion-selective membrane of opposite polarity through the application of direct current. Such membranes find extensive use in methods and apparatus for removing ionic constituents from electrolytic solutions and for use in the production of acids and bases.

PAT-APPL-446 833 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
FLUIDIZED BED IN REVERSE OSMOSIS PROCESSES.
Patent Application,
Houshang (NMI) Lolachi. Filed 28 Feb 74, 17p
DOCKET/SAL-2061
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Fluidized bed processing, Efficiency, Polarization(Charge separation), Turbulence, Mixing.
Identifiers: PAT-CL-210-353, *Reverse osmosis desalination, *Concentration polarization.

The patent application describes the incorporation of a fluidized bed of solid particles in a reverse osmosis module. This provides an efficient and economical means for controlling the salt concentration at the membrane interface. The presence of a fluidized bed in reverse osmosis and filtration systems produces vigorous turbulence and promotes mixing, while substantially reducing the concentration polarization and alleviating membrane fouling.

PAT-APPL-446 971 PC$5.25/MF$1.45
Department of the Interior, Washington, D.C.
DUAL TEMPERATURE COAL SOLVATION PROCESS.
Patent Application,
Willard E. Bull, Bruce Schmid, Charles H. Hinderliter, Charles H. Wright, and Gerald R. Pastor. Filed 4 Mar 74, 44p DOCKET/OCR-2144
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, Slurries, Liquefaction, Aromatic hydrocarbons, Hydrogenation, Liquids, Solids, Fossil fuels, Temperature, Organic solvents.
Identifiers: *Coal solvation.

The patent application describes a solvation process for producing deashed solid and liquid hydrocarbonaceous fuel from coal. Raw coal is slurried with a solvent comprising hydroaromatic compounds in contact with hydrogen in a first zone at a relatively high temperature to dissolve hydrocarbonaceous fuel from coal minerals by transfer of hydrogen from hydroaromatic solvent compounds to hydrocarbonaceous material in the coal. The solvent is then treated with hydrogen in a second zone at a lower temperature to replenish the solvent with hydrogen. Forced cooling of the slurry between zones accomplishes many significant improvements in the process.

PAT-APPL-446 973 PC$4.75/MF$1.45
Department of the Interior, Washington, D.C.
SOLVENT REFINED COAL PROCESS INCLUDING RECYCLE OF COAL MINERALS.
Patent Application,
Frank C. Shora, Jr., and Paul B. Tarman. Filed 4 Mar 74, 34p DOCKET/OCR-2145
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, Slurries, Hydrogenation, Recycling, Fossil fuels, Liquids, Solids, Liquefaction, Organic solvents, Aromatic hydrocarbons.
Identifiers: *Coal solvation.

The patent application describes a solvation process for producing deashed solid and liquid hydrocarbonaceous fuel from coal. Raw coal is slurried with a solvent comprising hydroaromatic compounds in contact with hydrogen in a first zone to dissolve hydrocarbonaceous fuel from

coal minerals by transfer of hydrogen from hydroaromatic solvent compounds to hydrocarbonaceous material in the coal. The solvent is then treated with hydrogen in a second zone to replenish the solvent with hydrogen. Hydroaromatic solvent and residue coal minerals arerecycled to the first zone.

PAT-APPL-446 974 PC$4.75/MF$1.45
Department of the Interior, Washington, D.C.
SOLVENT REFINED COAL PROCESS WITH RETENTION OF COAL MINERALS.
Patent Application,
Charles R. Hinderliter, and Russell E. Perrussel.
Filed 4 Mar 74, 33p DOCKET/OCR-2215
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, Organic solvents, Slurries, Liquefaction, Aromatic hydrocarbons, Hydrogenation, Liquids, Solids, Fossil fuels.
Identifiers: *Cool solvation.

The patent application describes a solvation process for producing deashed solid and liquid hydrocarbonaceous fuel from coal. Raw coal is slurried with a solvent comprising hydroaromatic compounds in contact with hydrogen in a first zone to dissolve hydrocarbonaceous fuel from coal minerals by transfer of hydrogen from hydroaromatic solvent compounds to hydrocarbonaceous material in the coal. The slurry is then treated with hydrogen in a second zone to replenish the solvent with hydrogen. The process is improved by retention of coal minerals in the second zone.

PATENT-2 789 888 Not available NTIS
Department of the Interior, Washington, D.C.
APPARATUS FOR PERFORMING THE FISCHER-TROPSCH REACTION.
Patent,
Ralph F. Tenney, Russell G. Dressler, and Herman A. Remmert. Filed 3 Mar 53, patented 23 Apr 57, 3p PAT-APPL-340 174,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Chemical reactors, *Beds(Process engineering), *Hydrocarbons, Carbon monoxide, Hydrogen, Catalysts, Iron, Synthesis(Chemistry).
Identifiers: PAT-CL-23-288, Synthetic fuels.

This invention relates to a process and apparatus for performing the Fischer-Tropsch reaction to make synthetic liquid hydrocarbons and chemicals (treatment of carbon monoxide and hydrogen in the presence of catalyst). An object of the invention is to make provision for retaining the catalyst, used in the process, in the reaction zone for its effective use. By so doing, the catalyst is not circulated through connecting parts of the system intended only for circulating oil, and erosion and excessive wear are prevented.

PATENT-2 813 823 Not available NTIS
Department of the Interior, Washington, D.C.
DESTRUCTIVE DISTILLATION OF HYDROCARBONACEOUS MATERIALS.
Patent,
Maurice W. Putman. Filed 19 Sep 56, patented 19 Nov 57, 11p PAT-APPL-610 849,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Oil shale, *Destructive distillation, *Condensation nuclei, Pyrolysis, Open channel flow, Heat transfer, Materials handling, Sodium chloride, Flow charting, Condensing.
Identifiers: PAT-CL-202-6.

This invention is generally related to the destructive distillation of solid hydrocarbonaceous materials and is particularly concerned with a method for the destructive distillation of oil shale to produce useful liquid products. Important details concern heat exchange, materials handling and general flow of materials, and artificially introduced condensation nuclei.

PATENT-2 860 101 Not available NTIS
Department of the Interior, Washington, D.C.
BALANCED HYDROGENATION OF COAL.
Patent,
Michail G. Pellpetz. Filed 20 Apr 53, patented 11 Nov 58, 3p PAT-APPL-349 988,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Hydrogenation, *Coal, Methane, Catalysts, Gasoline.
Identifiers: PAT-CL-208-10.

The invention concerns the catalytic hydrogenation of coal by a one step process which produces a product of high hydrogen to carbon ratio. It is self sustaining in that methane and a distillable oil from the process are used to continue the process. The product oil is basically non-asphaltic.

PATENT-2 901 402 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR DESTRUCTIVE DISTILLATION OF HYDROCARBONACEOUS MATERIALS.
Patent,
Maurice William Putman. Filed 19 Jul 57, patented 25 Aug 59, 9p PAT-APPL-673 099,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Destructive distillation, *Oil shale, *Condensation nuclei, Aluminum oxides, Hydrocarbons, Condensing, Heat exchange, Drops, Tin oxides, Titanium oxides, Process charting.
Identifiers: PAT-CL-202-6.

This invention is generally related to the destructive distillation of solid hydrocarbonaceous materials and is particularly concerned with a method for the destructive distillation of oil shale to produce useful liquid products. It has been found that by providing artificially induced condensation nuclei in the condensing zone, that the size of the fog or mist droplets may be controlled. The oxides of aluminum, tin, and titanium have been found to be very effective condensation nuclei.

PATENT-2 947 688 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS AND APPARATUS FOR THE DEMINERALIZATION OF SALINE WATER.
Patent,
George W. Murphy. Filed 10 Jan 57, patented 2 Aug 60, 8p PAT-APPL-634 138, DOCKET/SAL-260
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Desalting, *Osmosis, Demineralizing, Membranes, Feedwater treatment.
Identifiers: PAT-CL-210-23.

This invention relates to the demineralization of saline waters employing a unique power source derived from a brine and a water of lower salinity, to effect migration of ions from one solution to another across ion permeable membranes. In its simplest form, it consists of a cell of three chambers having impervious sides and bottoms, formed by four spaced, ion-permeable membranes, which are alternately cation-permselective and anion-permselective. Owing to the selective ion migration across the ion-permeable membranes, which is induced by the osmotic force resulting from the concentration difference, the middle chamber becomes less saline (considering the use of brine and saline water), the two outer chambers become more saline, and the brine becomes more dilute.

PATENT-3 150 923 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR REMOVING SULFUR DIOXIDE FROM GASES.
Patent,
Daniel Blenstock, and Joseph H. Field. Filed 18 Jan 62, patented 29 Sep 64, 6p PAT-APPL-167 198,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Air pollution control equipment, *Sulfur dioxide, *Absorbers, *Exhaust gases, *Patents, Manganese oxides, Flue gases.
Identifiers: PAT-CL-23-2.

The patent describes a cyclic process for substantially complete removal of acidic oxygenated sulfur compounds from a hot flue gas which comprises contacting the hot gas with a solid absorbent material consisting essentially of manganic oxide. A spent absorbent comprising manganese sulfate is formed. The spent absorbent is reactivated by decomposing the manganese sulfate to reform manganic oxide absorbers.

PATENT-3 181 929 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF INHIBITING CORROSION IN PURIFYING GASES.
Patent,
Joseph H. Field, and Daniel Bienstock. Filed 1 Dec 61, patented 4 May 65, 3p PAT-APPL-157 053, DOCKET/MIN-536
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Corrosion inhibitors, *Scrubbers, *Potassium carbonates, *Vanadates, Steels, Carbon dioxide, Hydrogen sulfide, Flue gases, Air pollution control equipment.
Identifiers: PAT-CL-23-3.

This patent is concerned with inhibiting the corroaive effect of aqueous potassium carbonate solutions on steel surfaces when used as a scrubbing agent for the removal of carbon dioxide and hydrogen sulfide from gas mixtures. Metavanadate salts which are at least slightly soluble in aqueous potassium carbonate solutions are not only highly effective in reducing the corrosive effect of such solutions on steel surfaces in gas-treating operations, but they also have the highly important advantage of retaining their solubility and anti-corrosion effectiveness in the presence both of CO2 and H2S.

PATENT-3 244 612 Not available NTIS
Department of the Interior, Washington, D.C.
DEMINERALIZATION ELECTRODES AND FABRICATION TECHNIQUES THEREFOR.
Patent,
George W. Murphy. Filed 29 Nov 61, patented 5 Apr 66, 4p PAT-APPL-155 594, DOCKET/SAL-602
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Carbon electrodes, *Anodes, *Polyelectrolytes, Anions, Imidazoles, Vinyl resins.
Identifiers: *Electrodialysis desalination, PAT-CL-204-294, *Anion responsive electrodes.

The invention relates to a method of fabricating an improved anion-responsive electrode for electrodialysis desalination. Carbon and graphite are mixed and then colloidally dispersed in a solution

of an organic polyelectrolyte which has a quaternized nitrogen group thereon. This dispersion is impregnated in a backing material to form a porous mixed carbon electrode from the colloidal dispersion of the carbon and graphite.

PATENT-3 250 701 Not available NTIS
Department of the Interior, Washington, D.C.
STABILIZATION OF DESALINATION MEMBRANES.
Patent,
Ellwood R. Watson, Harry W. Heidsman, and Bertram Kellin. Filed 15 Sep 65, patented 10 May 66, 3p PAT-APPL-489 769, DOCKET/SAL-835
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Reverse osmosis desalination, PAT-CL-210-22.

This invention relates to a method for operating reverse osmosis desalination cells for removing water from aqueous solution whereby the membranes used in reverse osmosis cells are stabilized. It has been discovered that the flux rate may be maintained at a high level by intermittently relaxing the pressure applied to the feed solution on the upstream side of the reverse osmosis cell and then repressurizing the system to resume continuous operation.

PATENT-3 262 865 Not available NTIS
Department of the Interior, Washington, D.C.
CHEMICAL TREATMENT AND DISTILLATION OF SEA WATER.
Patent,
Oscar B. Waters, Jr. Filed 15 Jul 63, patented 26 Jul 66, 2p PAT-APPL-295 220, DOCKET/SAL-729
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Gypsum, *Magnesium hydroxides, *Materials recovery, Distillation, Sea water, Scaling, Sulfuric acid, Desalting, Precipitation(Chemistry), Calcium chlorides, Calcium oxides.
Identifiers: PAT-CL-203-7.

This invention is directed toward a process for recovering substantially pure gypsum and substantially pure magnesium hydroxide as by-products when sea water is distilled in a tubular heat exchanger to produce potable water and still waste. Sulfuric acid, added to prevent the deposit of scale on the surface of the heat exchanger's tubes during distillation, is concentrated in the still waste. Lime is added to adjust the pH and calcium chloride is added, thereby precipitating substantially pure gypsum. Sufficient lime is added, thereby precipitating substantially pure magnesium hydroxide.

PATENT-3 271 326 Not available NTIS
Department of the Interior, Washington, D.C.
FLAME SPRAYING OF CATALYTICALLY ACTIVE PULVERIZED METAL OXIDES ON SUPPORTS.
Patent,
Albert J. Forney, and Joseph J. Demeter. Filed 22 Jul 63, patented 6 Sep 66, 2p PAT-APPL-296 870, DOCKET/MIN-563
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Catalysts, *Flame spraying, *Oxide coatings, Metals, Reduction(Chemistry), Nickel, Hydrogenation, Carbon monoxide, Metal coatings, Supports, Transition metals, Powder(Particles).
Identifiers: PAT-CL-252-466.

It is an object of the present invention to provide a convenient and economical means for preparing a catalyst that is highly efficient in the hydrogenation of carbon monoxide to produce hydrocarbon fuels. It has been found that this objective may be achieved by a process in which an oxide of a catalytic metal, such as nickel, is flame sprayed on a suitable support, followed by reduction of the metal oxide to form a porous coating of catalytic metal on the support.

PATENT-3 746 552 Not available NTIS
Department of the Interior, Washington, D.C.
GASIFICATION OF CARBONACEOUS SOLIDS.
Patent,
Ernest E. Donath. Filed 22 Sep 71, patented 17 Jul 73, 7p PAT-APPL-182 652, DOCKET/OCR-866, DOCKET/OCR-1078
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Coal gasification, Heating fuels, Superheating, Methane, Steam, Manufactured gas.
Identifiers: PAT-CL-48-202, High pressure, High temperature, Chars.

The invention provides a two-stage gasification process for carbonaceous solids, especially coal, wherein a low-sulfur fuel char and a methane rich gas comprise the principal products. The process employs two-stage coal gasification, each stage characterized by super pressures and high temperatures, and each stage further characterized in that each comprises a gasification as opposed to a conventional carbonization.

PB-229 848/7GA PC$4.25/MF$1.45
Auburn Univ., Ala. Water Resources Research Inst.
CONSERVATION OF WATER AND REDUCTION OF POLLUTION BY USE OF SOLVENT SYSTEMS FOR COLORING TEXTILE MATERIALS: AN ECONOMIC OUTLOOK.
Completion rept.,
David M. Hall, and Warren S. Perkins. Jan 74, 22p WRRI-Bull-20 W74-05535, OWRR-A-020-ALA(3)

Descriptors: *Dyeing, *Chlorohydrocarbons, Water, Comparison, Polyester fibers, Textile industry, Tetrachloroethylene, Reclamation, Economic analysis, Chemical equilibrium, Thermochemical properties.

It is economically feasible to use chlorinated solvents to replace water as the transfer vehicle in the dyeing of polyester fibers. The chlorinated solvent system takes less time and can be recovered at a fraction of the heat requirements needed for water; however, other problems associated with the solvent system must be solved before such a system will be accepted by the testile industry. (Author)

PB-230 693/4GA PC$6.25/MF$1.45
Celanese Research Co., Summit, N.J.
SEAWATER DESALINATION WITH PBI HOLLOW FIBER REVERSE OSMOSIS MEMBRANES.
Research and development progress rept.,
H. J. Davis, J. S. Soehngen, and F. S. Model. Mar 74, 65p Int-OSW-74-937
Contract DI-14-30-3199

Descriptors: Fabrication, Desalting, Benzimidazoles, Spinning(Extruding), Annealing, Field tests, Flux(Rate), Sea water, Performance evaluation, Chlorination.
Identifiers: *Hollow fiber membranes, *Reverse osmosis desalination, *PBI polymers, Polybenzimidazoles.

Laboratory evaluations have shown that the reverse osmosis properties of PBI (polybenzimidazole) hollow fiber membranes are adequate for a single-pass desalination of seawater at an operating pressure of 1,000 psi. In field evaluation tests against chlorinated sea water total dissolved solids concentrations as low as 108 to 174 ppm were reported. The outstanding reverse osmosis properties were achieved by annealing PBI hollow fibers in a free-to-shrink condition for 5 minutes in ethylene glycol at 165C. A research study of spinning parameters yielded the spinning conditions necessary to obtain fibers with the necessary filament properties and dimensions. Heavy chlorination did not at all affect PBI membrane performance over the test period studied.

PB-230 706/4GA PC$5.50/MF$1.45
Du Pont de Nemours (E.I.) and Co., Wilmington, Del.
DEVELOPMENT OF SEAWATER MEMBRANES. PART I.
Research and development progress rept.,
N. W. Rosenblatt, J. P. Agrawal, R. A. Halling, and R. C. Rollings. Mar 74, 191p* Int-OSW-RDPR-74-933
Contract DI-14-30-2739
See also PB-230 707.

Descriptors: *Membranes, *Polyamide resins, *Hydrazides, Fouling prevention, Performance evaluation, Sea water, Casting, Fabrication, Permeability.
Identifiers: *Reverse osmosis desalination, Tubular membranes.

Development work with the single-stage DP-1 polyamide-hydrazide seawater membrane is described. Reverse osmosis testing with synthetic and with natural seawater was carried out with cells and with tubular configurations. A perforated tube assembly capable of seawater desalination in one-pass was developed. Sustained capability to recover potable water was demonstrated with tubes and with cells in the lab and in the field. A candidate for the first stage of a two-pass RO process exceeded goal performance. It was developed from the DP-1 polymer by modifying the casting composition and chelating the amidehydrazide with copper. Fouling and fouling control are discussed. (Modified author abstract)

PB-230 707/2GA PC$5.75/MF$1.45
Du Pont de Nemours (E.I.) and Co., Wilmington, Del.
DEVELOPMENT OF SEAWATER MEMBRANES. PART II.
Research and development progress rept.,
N. W. Rosenblatt, J. P. Agrawal, R. A. Halling, and R. C. Rollings. Mar 74, 223p Int-OSW-RDPR-74-934
Contract DI-14-30-2739
See also PB-230 706.

Descriptors: *Feedwater treatment, Capitalized costs, Chlorination, Flux(Rate), Fouling prevention, Sand filtration, Coagulation, Sea water, Operating costs, Casting, Performance evaluation, Field tests, Cost estimates.
Identifiers: *Reverse osmosis desalination, Tubular membranes, *Spiral wound membranes, Wrightsville Beach desalination plant.

Seawater pretreatment consisting of alum coagulation and filtration with sand and diatomaceous earth filters produced water of high clarity. Chlorination coupled with carbon treatment to remove excess chlorine provided effective disinfection at Ocean City until the carbon beds become contaminated with bacteria. The pretreatment has reduced flux decline in tubular RO devices. Potable water was produced consistently at Ocean City for one year with a sea of annular cells having a membrane area of one square foot. Several small spiral elements wound with DP-1 membranes showed in the lab 99% rejection at 1000 psi, but flux was significantly lower than in cell tests. A continuous process was developed for casting DP-1 membranes of 12 inch width for spiral elements. These membranes frequently achieved single-stage performance after post-treatment. Capital and operating costs for seawater treatment and for one and two-pass desalination were developed along with necessary supporting information. (Modified author abstract)

7B. Inorganic Chemistry

AD-776 719/7GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
CHARACTERIZATION OF THE THERMAL DEHYDRATION OF ZIRCONIUM OXIDE HALIDE OCTAHYDRATES,
D. A. Powers, and Harry B. Gray. 16 Apr 72, 6p
Rept no. Contrib-4675 AROD-8389.5-C
Grant DA-ARO-D-31-124-72-G116
Availability: Pub. in Inorganic Chemistry, v12 n11 p2721-2726 1973.

Descriptors: *Dehydration, *Infrared spectra, *Zirconium oxides, Differential thermal analysis, Bromides, Chlorides, Spectrum analysis, Crystal structure, X ray diffraction, Thermogravimetric analysis, Hydrates, Molecular structure.

The compounds ZrOX2.8H2O (X = Cl, Br) dehydrate thermally in a stepwise manner to the respective hexahydrates, tetrahydrates, and finally ZrO2. Dehydration is complete at 700C. The intermediate hydrates have been isolated and characterized. Several regions of the infrared spectra of the various hydrates have been assigned with the aid of analogous deuterated compounds. The experimental evidence may be interpreted in terms of the structural formulations for the octahydrates, hexahydrates, and tetrahydrates. (Modified author abstract)

PB-229 837/0GA PC$6.25/MF$1.45
Missouri Water Resources Research Center, Columbia.
DETERMINATION OF THE RATE OF TRIPOLY- AND PYRO-PHOSPHATE HYDROLYSIS IN SEDIMENTS.
Completion rept., 1 Jul 72-30 Jun 73,
R. W. Blanchar, and Doningo Riego. 15 Jan 74, 61p W74-05542, OWRR-A-059-MO(1)
Contract DI-14-01-0001-3825

Descriptors: *Inorganic phosphates, *Hydrolysis, *Sediments, Reaction kinetics, Half life, Water pollution, Fertilizers.

The rate of hydrolysis of tripolyphosphate (TPP) and pyrophosphate (PP) in sediments was determined. The sediments were collected from Cape Fair, Thomas Hill Lake, Flat Branch Creek, and Maries River. The rate of hydrolysis of TPP and PP was similar to that predicted from first order kinetics. Half lives for the hydrolysis of TPP and PP were 1.6 to 2.6 and 6.7 to 27.4 days, respectively. The influence of temperature, biological activity, and pH on the rate of TPP and PP hydrolysis was investigated using Flat Branch Creek sediment. (Modified author abstract)

7C. Organic Chemistry

AD-776 366/7GA PC$3.00/MF$1.45
Princeton Univ N J Dept of Chemical Engineering
LINEAR POLYCARBORANESILOXANES.
Technical rept. Sep 73-Mar 74,
J. K. Gillham, and M. B. Roller. Mar 74, 23p* Rept no. TR-21
Contract N00014-67-A-0151-0024

Descriptors: *Carboranes, *Siloxanes, High temperature, Elastomers, Molecular structure, Physical properties, Phase transformations, Melting, Crystallization, Glass, Polymers, Chemical structure, Thermal stability, Thermogravimetric analysis, Thermomechanics, Differential thermal analysis, Oxidation.
Identifiers: *Polycarboranes.

Aspects of the present status of structure-property correlations for linear polycarboranesiloxanes which contain rigid carborane cages and flexible siloxane in-chain linkages are discussed. Low temperature secondary transitions, glass transitions, crystallization and melting transitions, and high temperature chemical transformations in inert and air atmospheres are emphasized. The linear polymers serve as the basis for new high-temperature elastomers. (Author)

AD-776 431/9GA Reprint
Brandeis Univ Waltham Mass Dept of Chemistry
ORGANOIRON COMPLEXES FORMED IN THE REACTION OF DIIRON ENNEACARBONYL WITH SEMIBULLVALENE,
D. Ehntholt, A. Rosan, and M. Rosenblum. 28 Nov 72, 9p AROD-8777.4-C
Grant DA-ARO(D)-31-124-71-G138
Availability: Pub. in Jnl. of Organometallic Chemistry, v56 p315-321 1973.

Descriptors: *Metal carbonyls, *Iron compounds, *Polycyclic compounds, Metalorganic compounds, Metal complexes, Chemical reactions, Nuclear magnetic resonance, Infrared spectra.
Identifiers: Tricyclo(3-3-2-0(2-8))decatrienes, *Rearrangement reactions.

Semibullvalence reacts with diiron enneacarbonyl to give four iron carbonyl complexes, C8H8Fe2(CO)8 (XI) possessing an intact semibullvalene skeleton, C8H8Fe(CO)3(XII) and C8H8Fe2(CO)7 (XIII) resulting from a cleavage of the cyclopropane ring, and C8H6Fe2(CO)6, formed by further skeletal rearrangement of XIII. (Author)

AD-776 452/5GA Reprint
California State Univ San Diego Dept of Chemistry
DETERMINATION OF ORGANIC PEROXIDES IN LOW CONCENTRATION BY A BIAMPEROMETRIC METHOD,
F. C. Montgomery, R. W. Larson, and W. H. Richardson. 29 Jun 73, 4p AROD-9650.6-C
Grant DA-ARO-D-31-124-71-G83
Revision of report dated 5 Apr 73.
Availability: Pub. in Analytical Chemistry, v45 n13 p2258-2260 Nov 73.

Descriptors: *Peroxides, Thiosulfates, Chemical analysis, Volumetric analysis, Oxygen heterocyclic compounds.
Identifiers: *Amperometry, Dioxetanes.

The report describes a biamperometric procedure for the determination of small quantities of 1,2-dioxetanes with sodium thiosulfate and potassium iodate as titrants and with the peroxide decomposition carried out in a tert-butyl alcohol solution containing potassium iodide and citric acid. The method is suitable for conveniently measuring low concentrations of peroxides and should prove useful in kinetic studies or where hazards or natural occurrence dictate analyses of small amounts of peroxides. (Modified author abstract)

AD-776 478/0GA Reprint
California State Univ San Diego Dept of Chemistry
THERMAL DECOMPOSITION OF TERTIARY ALKYL PEROXIDES. SUBSTITUENT EFFECTS IN PEROXIDE BOND HOMOLYSIS AND BETA SCISSION OF ALKOXY RADICALS,
W. H. Richardson, M. B. Yelvington, A. H. Andrist, E. W. Ertley, and R. S. Smith. 11 May 73, 9p AROD-9650.7-C
Contract DA-ARO-D-31-124-71-G83
Availability: Pub. in the Jnl. of Organic Chemistry, v38 n25 p4219-4225 1973.

Descriptors: *Peroxides, *Pyrolysis, Reaction rates, Chemical structure, Reaction kinetics, Chemical bonds.
Identifiers: Chemical reaction mechanisms.

Rate coefficients for the thermal decomposition of a series of substituted tertiary alkyl peroxides in chlorobenzene at 150C were obtained. The sum of the polar substituent constant and the reaction constants were calculated. Mechanistic schemes are considered to explain the kinetic data, as well as the products from 7 and 8. Substituent effects in beta scission of unsymmetrically substituted tert-alkoxy radicals, produced from alkyl peroxides, are reported. These data are considered in terms of a Polanyi relationship. (Modified author abstract)

AD-776 589/4GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
ALTERNATE SYNTHESIS OF 4-AMINOBENZIL.
Technical rept.,
Hubert J. Booth. 24 Jan 74, 15p Rept no. NOLTR-74-3

Descriptors: *Synthesis(Chemistry), Catalysts, Hydrogenation, Ketones, Aromatic compounds.
Identifiers: Benzil/amino, *Benzils.

Three alternate synthetic routes to 4-aminobenzil, a component used in the synthesis of the high-temperature amide- and imidequinoxaline copolymers, were investigated. Catalytic hydrogenation of 4-nitrobenzil was found to give good (60-65% vs. 25% for present method) yields of 4-aminobenzil, and, thus, represents the most successful route. (Author)

AD-776 850/0GA Reprint
Wisconsin Univ Madison Dept of Chemistry
ORGANOSILYLHYDRAZYL RADICALS AND A POSSIBLE TRIAZYL RADICAL,
Robert West, and Blake Bichlmeir. 22 Jun 73, 3p
AFOSR-TR-74-0393
Grant AF-AFOSR-1904-70
Availability: Pub. in the Jnl. of the American Chemical Society, v95 p7897 1973.

Descriptors: *Free radicals, Electrochemistry, Synthesis(Chemistry), Hydrazine, Electron paramagnetic resonance, Photolysis, Oxidation.
Identifiers: *Hydrazines, Silicon organic compounds, *Hydrazyl radicals.

Tris(trimethylsilyl)hydrazyl and tris(tert-butyldimethylsilyl)hydrazyl have been made by both (1) electrolytic oxidation of the lithium salt of the parent hydrazine and (2) ultraviolet photolysis of the parent hydrazine, and identified by electron spin resonance spectroscopy. These compounds are the first organometallic hydrazyl to be prepared and are much more stable than alkyl hydrazyls. When tris(trimethylsilyl)hydrazyl is allowed to stand in solution at room temperature it gradually disappears and an esr spectrum is obtained which is attributed to tetrakis(trimethylsilyl)triazyl radical. (Author)

AD-776 860/9GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Chemistry
SYNTHESIS OF HETEROCYCLIC SYSTEMS VIA 1,4-ADDITION REACTIONS OF PHENYL(BROMODICHLOROMETHYL)MERCURY DERIVED DICHLOROCARBENE,
Dietmar Seyferth, and Houng-min Shih. 17 Apr 73, 3p AFOSR-TR-74-0453
Grant AF-AFOSR-2204-72
Availability: Pub. in Jnl. of the American Chemical Society, v95 p8464-8465 1973.

Descriptors: *Oxadiazoles, *Carbenes, Synthesis(Chemistry), Oxygen heterocyclic compounds.
Identifiers: *Oxazoles, Chemical reaction mechanisms, Methylene carbene/dichloro, Mercury/(bromo-dichloro)methyl-phenyl.

Recently the authors discussed the reaction of phenyl(trihalomethyl)mercury compounds with azodicarboxylate esters. It was expected that such formal 1,4 addition of CX2 might be possible with other alpha,beta-unsaturated systems, and the preparation of an oxadiazole and an oxazole by similar processes is reported.

AD-776 883/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio

METHOD OF OBTAINING GEMINATE BIS-(DIFLUOROAMINO) COMPOUND,
A. V. Fokin, Yu. M. Kosyrev, V. I. Shevchenko, and G. M. Potarinz. 11 Mar 74, 7p Rept no. FTD-HT-23-1373-74
Edited trans. of Patent (USSR) 299 505 p1-2, 26 Mar 72, by Dean F. W. Koolbeck.

Descriptors: *Fluoroamines, Cyclohexanes, Synthesis(Chemistry), Patents, Translations, USSR.
Identifiers: Methylamine/N-difluoro-triphenyl.

The Russian patent describes a method of obtaining geminate bis-(difluoroamino) compounds by reacting a carbonyl compound with a difluoroaminizing agent in the presence of a protonating agent. It is distinguished by the fact that in order to simplify the technological process triphenyldifluoroamino-methane is used as the difluoroaminizing agent.

AD-776 930/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD OF OBTAINING DIFLUOROAMINOACETIC ACID ESTERS,
A. V. Fokin, Yu. N. Studnev, L. D. Kuznetsova, and V. I. Medvedev. 11 Mar 74, 7p Rept no. FTD-HT-23-1374-74
Edited trans. of Patent (USSR) 317 647 p1-2, 19 Oct 71, by Dean F. W. Koolbeck.

Descriptors: *Glycine, *Acetates, *Fluorination, *Fluoroamines, Synthesis(Chemistry), Patents, USSR, Translations.
Identifiers: Nitrogen fluoride(N2F4).

The Russian patent concerns a method for obtaining esters of difluoroaminoacetic acid. It is distinguished by the fact that the ester of acetic acid is treated with tetrafluorohydrazine in a medium of an inert solvent with heating. The process is carried out with heating to 100C.

AD-776 931/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD OF OBTAINING FLUOROIMINO DERIVATIVES OF ORGANIC COMPOUNDS,
A. V. Fokin, Yu. N. Studnev, and L. D. Kuznetsova. 11 Mar 74, 7p Rept no. FTD-HT-23-1375-74
Edited trans. of Patent (USSR) 311 902 p1-2, 19 Aug 71, by Dean F. W. Koolbeck.

Descriptors: *Imines, Sulfonates, Fluorine compounds, Acetonitrile, Synthesis(Chemistry), Patents, USSR, Translations.
Identifiers: *Fluoroimines.

The Russian patent describes a method of preparing fluoroimino derivatives of organic compounds with the general formula (R)2-C=NF, where R=COOC2H5, CN. It is distinguished by the fact that oxydifluoroaminofluorosulfonate is reacted with the sodium derivatives of organic compounds - e.g., sodium malonic ester - at reduced temperature with subsequent separation of the target product by an existing method. The process is carried out in a medium of acetonitrile.

AD-776 932/6GA PC$3.00/MF$.145
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD OF OBTAINING BIS-(DIFLUOROAMINO)-PENTENE,
F. L. Maklyaev, A. V. Fokin, M. I. Druzin, A. P. Kutepov, and V. A. Ivanov. 11 Mar 74, 7p Rept no. FTD-HT-23-1376-74
Edited trans. of Patent (USSR) 302 328 p1-2, 28 Apr 71, by Dean F. W. Koolbeck.

Descriptors: *Fluoroamines, *Penta dienes, *Fluorination, Synthesis(Chemistry), Translations, USSR, Patents.
Identifiers: Nitrogen fluoride(N2F4), *Pentenes.

The Russian patent describes a method of obtaining bis-(difluoroamino) pentene by reacting tetrafluorohydrazine with diene hydrocarbons. It is distinguished by the fact that in order to increase the yield of the product piperylene is used as the diene hydrocarbon and the reaction is carried out in the medium of an inert solvent - e.g. freon-113 - at room temperature and with a preferred pressure of 220-280 mm Hg.

AD-776 945/8GA PC$3.75/MF$1.45
Frankford Arsenal Philadelphia Pa
INVESTIGATION OF A QUICK AND SIMPLIFIED METHOD TO MANUFACTURE TETRACENE.
Technical rept.,
George A. Younger. Oct 73, 51p* Rept no. FA-R-2093

Descriptors: *Tetrazenes, Explosives initiators, Guanidines, Production rate, Synthesis(Chemistry), Sulfates, Primers.

An experimentation was conducted with aminoguanidine sulfate salt to determine whether the process time for the production of tetracene (currently made from aminoguanidine bicarbonate salt) could be reduced. Tetracene was made in one operation under controlled conditions (temperature, pH and fluid flow) using aminoguanidine sulfate, sodium nitrite and glacial acetic acid. This represents a distinct advantage over the current process that involves two operations. Less time, material and equipment is required to make a specified amount of tetracene when aminoguanidine sulfate is used. (Modified author abstract)

AD-894 598/2GA PC$5.00/MF$1.45
Rice Univ., Houston, Tex. Dept. of Chemistry.
DIRECT FLUORINATION OF ORGANIC COMPOUNDS.
Final rept. 1 Oct 70-30 Sep 71,
John L. Margrave, R. B. Badachhape, A. P. Conroy, J. J. Wang, and F. D. Catrett. Feb 72, 37p
AFML-TR-71-271
Contract F33615-71-C-1043
Distribution Limitation Now Removed.

Descriptors: (*Organic compounds, Fluorination), Glutaric acids, Xylenes, Nitric acid, Reaction kinetics, Aliphatic compounds, Ethers, Methane, Acetic acids, Heterocyclic compounds, Polymers, Ethylenes, Photolysis, Clycols, Rubber, Acetates, Polyethylene plastics, Thermal stability, Degradation, Cyclohexanes, Alkynes, Fluorine, Formic acids, Absorption spectrum, Infrared spectroscopy, Dibasic acids, Salts, Hydrocarbons, Oxidation, Corrosion resistance.
Identifiers: Sodium acetate, Monomers.

The report contains results on the direct fluorination of a variety of organic compounds and materials. The compounds studied included: ortho-toluic acid, metatoluic acid, para-toluic acid, sodium acetate, diglycolic acid, diphenyl ether, 2-ethoxyethylacetate, 3-oxoglutaric acid, 2-oxoglutaric acid, methoxyacetic acid. These materials have been fluorinated at low concentrations of fluorine and at a variety of temperatures. Polyethylene has been surface fluorinated and the kinetics of the process have been studied. Natural rubber samples were surface treated with fluorine and appear to survive acceptably. Matrix isolation studies of organic molecules in fluorine matrices are also reported.

CONF-731052-1 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
FORMATION OF NITROSAMINES FROM TERTIARY AMINES AND NITROUS ACID.
W. Lijinsky, and G. Singer. 1973, 10p

Descriptors: (*Nitrous acid, *Chemical reactions), (*Amines, Chemical reactions), (*Nitroso compounds, *Chemical reaction yield), (*Carcinogens, Chemical reaction yield).

For abstract, see NSA 29 07, number 17974.

N74-16864/2GA PC$5.25/MF$1.45
Institut fuer Chemie der Treibstoffe, Berghausen (West Germany).
PREPARATION OF POLY(2-BUTENE 1,4-DIOL DINITRATE) DARSTELLUNG VON POLYBUTEN(2)-DIOLDINITRAT (1,4).
K. M. Bucerius. 21 Dec 72, 42p ICT-10/72
Language in German.

Descriptors: *Alcohols, *Butenes, *Organic nitrates, *Polymerization, Chemical reactions, Explosives, Infrared spectra, Molecular weight, Polymer chemistry, Thermal stability.

For abstract, see STAR 1208

PAT-APPL-275 612 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
IMPROVED METHOD OF PURIFYING CONCENTRATED COLOR EXTRACTS FROM CITRUS PEELS.
Patent Application,
Robert E. Berry, James H. Tatum, and Charles W. Wilson, III. Filed 25 Jul 72, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Carotenoids, *Purification, Propanols, Hexanes, Solvent extraction, Citrus fruits, Precipitation(Chemistry), Plant pigments.
Identifiers: PAT-CL-99-100, *Food coloring.

The patent application relates to a new method for purifying a highly colored concentrated crude pigment fraction extracted from orange peel after concentration. The coloring material from peel of various citrus fruit is hexane-extracted and dissolved in 2-propanol then diluted with water thereby causing precipitation of carotenoids which impart coloration to foodstuff without imparting the flavor or aroma of the citrus. The new process avoids the steps of saponification, neutralization, and extensive washing of the processes of the prior art.

PAT-APPL-288 802 PC$5.00/MF$1.45
Department of Agriculture, Washington, D.C.
N-ETHYL-N-3-ETHOXYPROPYL-OLEAMIDES.
Patent Application,
Robert R. Mod, Frank C. Magne, and Evald L. Skau. Filed 13 Sep 72, 39p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Plasticizers, Vinyl chloride resins, Amides.
Identifiers: *Oleamides, PAT-CL-260-404, Oleamide/N-ethoxypropyl-N-ethyl.

The Patent application provides an N-ethyl-N-3-ethoxypropyl-oleamide which is useful as a plasticizer for vinyl chloride resins. It also describes synthesis of other N,N-disubstituted long-chain aliphatic amides.

PAT-APPL-288 807 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
THE PREPARATION OF DIBASIC DIMERIC RESIN ACIDS.
Patent Application,
Walter H. Schuller. Filed 12 Sep 72, 10p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Dibasic organic acids, Dimerization, Synthesis(Chemistry), Catalysts, Palladium organic compounds, Ethylene, Rosin, Polyester laminates.
Identifiers: Podacarpo-8-11-13-trien-15-oic acid/isopropyl, PAT-CL-260-26.

The patent application concerns reacting ethylene with dehydroabietic acid (or disproportionated

rosin) in the presence of palladium (II) acetate to give mixed dimeric dibasic acids. The products are useful in the preparation of modified styrenated laminating polyesters.

PAT-APPL-288 812 PC$5.00/MF$1.45
Department of Agriculture, Washington, D.C.
N-CYCLOHEXYL-N-2-ACETOXYETHYL-OLEAMIDE.
Patent Application,
Robert R. Mod, Frank C. Magne, and Evald L. Skau. Filed 13 Sep 72, 39p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Plasticizers, *Amides, Vinyl chloride resins, Synthesis(Chemistry), Oleic acid, Fatty acids.
Identifiers: PAT-CL-260-404-000, *Oleamides.

This invention relates to certain compounds which are N-acyl derivatives of symmetrical or asymmetrical secondary amines which are useful as plasticizers for vinyl chloride resins. More particularly, this invention relates to N,N-disubstituted long-chain aliphatic amides the acyl component of which if saturated is an alkanoic acyl containing from 10 to 18 carbon atoms, and if unsaturated is a monoalkenoic acyl containing from 18 to 22 carbon atoms, the amide nitrogen in all cases being the nitrogen atom of a symmetrical or asymmetrical secondary, acyclic or alicyclic amine, said secondary amine being a substituted or unsubstituted acyclic or alicyclic amine.

PAT-APPL-335 860 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PHOSPHONATED N,N-DISUBSTITUTED FATTY AMIDES.
Patent Application,
Robert R. Mod, James A. Harris, Jett C. Arthur, Jr., Frank C. Magne, and Gene Sumrell. Filed 26 Feb 73, 16p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Antiinfectives and antibacterials, *Morpholines, *Amides, *Phosphonates, Radiation chemistry, Synthesis(Chemistry), Chain reactions, Free radicals, Gamma rays, Fungicides, Addition reactions, Phosphites, Phosphorus organic compounds.
Identifiers: PAT-CL-260-326-50-A.

The patent application describes the preparation of phosphonated N,N-disubstituted fatty amides by the free radical addition of dialkyl phosphites to terminal and nonterminal double bands of N,N-disubstituted amides. The free radical additions of the dialkyl phosphites to the unsaturated amides were initiated by irradiation with gamma radiation from cobalt-60. These new compounds exhibit antimicrobial activity.

PAT-APPL-337 791 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
USE OF EPOXIDES IN THE PREPARATION OF HIGHER FATTY ACID ANHYDRIDES.
Patent Application,
John B. McKelvey, and Ruth R. Benerito. Filed 5 Mar 73, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Synthesis(Chemistry), *Anhydrides, *Fatty acids, Epichlorohydrin, Epoxy compounds.
Identifiers: PAT-CL-8-129.

This invention relates to a process for the preparation of higher fatty acid anhydrides. More particularly, this invention relates to the use of epoxides (e.g. epichlorohydrin) in the preparation of higher fatty acid anhydrides.

PAT-APPL-337 792 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
POLYMERIZED ROSIN PRODUCT AND PROCESS FOR THE PRODUCTION OF SAME.
Patent Application,
Bernard A. Parkin, Jr., and Walter H. Schuller. Filed 5 Mar 73, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Rosin, *Polymerization, *Solvent extraction, Sulfuric acid, Acetic acid, Solubility, Melting points.
Identifiers: PAT-CL-424-308.

The patent application concerns the polymerization of rosin or resin acids in reaction mixtures of sulfuric acid, water, and acetic acid. This is performed in such proportions that the rosin or resin acids are readily soluble and the polymerized rosin or resin acids are of limited solubility separating in a polymer-rich layer which may be removed for isolation of the polymerized rosin. The process is continuous. The fractionation of polymerized rosin or resin acids into a high-melting resin having a molecular weight indicating it to be a dimer and low melting fraction containing monomer and dimer has also been accomplished through solvent extraction.

PAT-APPL-374 584 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
3,7 DICYANO-3,5,7-TRIAZA-1-PHOSPHABICYCLO (3.3.1) NONANE AND DERIVATIVES.
Patent Application,
Donald J. Daigle, Armand B. Pepperman, Jr., and Floyd L. Normand. Filed 28 Jun 73, 6p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Fire resistant textiles, *Phosphines, *Polycyclic compounds, Organic salts, Phosphine oxides, Phosphorus organic compounds, Heterocyclic compounds, Synthesis(Chemistry), Nitrogen heterocyclics with 3N, Iodides.
Identifiers: PAT-CL-374-584, Triazaphosphabicyclo(3-3-1)nonane/dicyano.

The patent application describes the preparation of 3,7 Dicyano-3,5,7-Triaza-1-phosphabicyclo (3.3.1) nonane. The phosphine was converted to the phosphine oxide derivative by reaction with tertiary butyl hydroperoxide and to the methyl phosphonium iodide derivative by reaction with methyl iodide. These compounds are useful as flame retardants for cellulosic textiles.

PAT-APPL-391 189 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
A MONOPHOSPHORUS ANALOG OF HEXAMETHYLENETETRAMINE AND DERIVATIVES.
Patent Application,
Donald J. Daigle, and Armand B. Pepperman, Jr. Filed 24 Aug 73, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Fire resistant textiles, *Phosphines, Phosphorus organic compounds, Nitrogen heterocyclics with 3N, Heterocyclic compounds, Polycyclic compounds.
Identifiers: PAT-CL-088-166-200, *Adamantanes, Triazaphosphatricyclo(3-3-1-1(3-7))decane.

The patent application concerns the following: 1,3,5-Triaza-7-phosphaadamantane was prepared. The phosphine was converted to the phosphine oxide derivative by reaction with hydrogen peroxide and the methyl azonium iodide derivative of both the phosphine and the phosphine oxide was prepared by reaction with methyl iodide. The derivatives are useful as flame retardants for cellulosic textiles.

PATENT-3 662 092 Not available NTIS
Department of the Interior, Washington, D.C.
REDUCTION OF THE THIOPHENE NUCLEUS.
Patent,
Irving Wender, and Milton Orchin. Filed 2 Apr 57, patented 26 Sep 61, 2p PAT-APPL-650 283,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Thiophenes, *Hydrogenation, *Catalysts, Esters, Sulphur heterocyclic compounds, Reduction(Chemistry), Cobalt carbonyls, Carbon monoxide, Hydrogen.
Identifiers: PAT-CL-260-332-2, Thiophene carboxylic acid/(Ethyl-ester).

This invention relates to the hydrogenation of the thiophene nucleus in the thiophenecarboxylate compounds by means of CO and H2 while employing a cobalt carbonyl catalyst.

PATENT-3 674 890 Not available NTIS
Department of Agriculture, Washington, D.C.
METHODS FOR PREPARING VALUABLE KETO AND HYDROXY CYCLIC COMPOUNDS.
Patent,
Charles H. Fisher. Filed 3 Jan 68, patented 4 Jul 72, 7p PAT-APPL-695 323,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthesis(Chemistry), *Phenols, *Aromatic ketones, Allene, Polyhydric phenols, Hydroquinone, Cyclohexene compounds, Phenol, Resorcinols, Pyrocatechols, Quinones, Ozonides, Ozonization, Cyclohexane compounds.
Identifiers: PAT-CL-260-621-R.

This invention relates to the conversion of polyexomethylene cyclohexanes and polyexomethylene cylcohexenes to ketone cylic compounds and hydroxy aromatic compounds. The exo-methylene groups (= CH2) are first converted to ozonides and the ozonide is then converted to ketones which rearrange to the hydroxy cyclic and aromatic compounds. The resultant hydroxy compounds are used as antioxidants, preservatives, intermediates for making resins, plastics, adhesives, pharmaceuticals, and dyes.

PATENT-3 691 158 Not available NTIS
Department of Agriculture, Washington, D.C.
HEXACHLOROCYCLOPENTADIENE ADDUCTS OF UNSATURATED AMIDES OF AZABICYCLONONANE.
Patent,
Robert R. Mod, Franck C. Magne, and Evald L. Skau. Filed 16 Dec 71, patented 12 Sep 72, 7p PAT-APPL-208 948,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Amides, Chlorine aliphatic compounds, Germicides, Plasticizers, Cyclopentadiene compounds.
Identifiers: PAT-CL-260-239-BA.

This invention relates to certain new nitrogen-containing compounds, more particularly to N-substituted and N,N-disubstituted amides, the acyl moieties of which are the acyl moieties of the hexachlorocyclopentadiene adducts of either 9-octadecenoic or 10-undecenoic acids. The compounds which are the subject of this invention are characterized by the fact that as growth inhibitors they are effective against a variety of bacteria, yeasts, and molds, some of which are pathogenic. They are also useful as plasticizers.

PATENT-3 702 338 Not available NTIS
Department of Agriculture, Washington, D.C.
HYDROXY-METHYLATED DERIVATIVES OF RESIN ACIDS, THEIR USE IN ELASTOMERIC POLYURETHANES.
Patent,
John B. Lewis, and Glen W. Hedrick. Filed 12 May 70, patented 7 Nov 72, 5p PAT-APPL-36 672,

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Rosin, *Polyurethane resins, Synthesis(Chemistry), Polycyclic compounds, Plastic coatings, Additives, Glycols, Esters.
Identifiers: Podacarpa-7-13-dien-15-oic acid/dihydro, PAT-CL-260-468-5.

This invention describes the preparation of the glycols and the esters of levopimaric acid (from pine oleoresin). Small amounts of these resin acid derivatives give added strength to polyurethane films prepared from propylene glycol polyethers and could be useful intermediates for industry.

PATENT-3 713 979 Not available NTIS
Department of Agriculture, Washington, D.C.
PRODUCTION OF MANNANS BY FERMENTATION.
Patent,
Morey E. Slodki, Millie Jo Smiley, and Dwight E. Heasley. Filed 28 May 71, patented 30 Jan 73, 4p PAT-APPL-148 131,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fermentation, *Yeasts, Mannose, Polymers.
Identifiers: PAT-CL-195-31-P, *Mannans.

The patent describes extracellular production of mannan polymers by yeast previously known to produce only phosphomannans. Hydrolysis of the polymers with a mineral acid catalyst results in substantially pure D-mannose.

PATENT-3 729 379 Not available NTIS
Department of Agriculture, Washington, D.C.
HYDROXY-CONJUGATED FATTY ACIDS.
Patent,
Edward A. Emken. Filed 31 Aug 71, patented 24 Apr 73, 4p PAT-APPL-176 753,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthesis(Chemistry), *Linoleic acid, Enzymes, Fatty acids, Vegetable oils, Methyl sulfoxide, Metallic soaps.
Identifiers: Octadecadienoic acid/hydroxy, PAT-CL-195-30, Lipoxygenase.

This invention relates to a method of producing hydroxy-conjugated octadecadienoic acid from linoleic acid contained in vegetable oils and soap stocks from alkali-refined vegetable oils. Linoleic acid soaps are dispersed in an aqueous medium containing dimethyl sulfoxide with the enzyme soybean lipoxygenase.

PATENT-3 729 461 Not available NTIS
Department of Agriculture, Washington, D.C.
SYNTHESIS OF GLYCOSYL GLYCERIDES.
Patent,
Yeshajahu Pomeranz, and Hans Peter Wehrli. Filed 23 Dec 70, patented 24 Apr 73, 4p PAT-APPL-101 135,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Glycerides, *Synthesis(Chemistry), *Glycolipids, Sugar alcohols, Galactose, Fatty acids, Glycosides, Stereochemistry, Molecular structure, Acid halides.
Identifiers: PAT-CL-260-210-R.

The invention relates to some naturally occurring glycosyl glycerides, i.e., glycolipids containing fatty acid, glyceride, and glycoside moieties. More specifically, it relates to a method of synthesizing glycosyl glycerides having fatty acids attached specifically to either the 1-position or both the 1- and 2-positions of the glycerol moiety in which the optical activity at the 2-position is preserved. Starting materials are 2,5-methylene-D-mannitol acetobromogalactose and fatty acid chlorides.

PATENT-3 733 275 Not available NTIS
Department of Agriculture, Washington, D.C.
N-SUBSTITUTED FATTY ACID AMIDE LUBRICANTS.
Patent,
Frank C. Hagne, Robert R. Mod, Gene Sumrell, and Winfred E. Parker. Filed 21 Dec 71, patented 15 May 73, 6p PAT-APPL-210 591,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Amines, *Lubricants, High pressure tests, Synthesis(Chemistry).
Identifiers: PAT-CL-252-46-3.

This invention relates to certain compounds which are N-fatty acyl derivatives of primary and second amine and N-substituted acyl derivatives of primary and secondary amines which have exhibited utility as base lubricants, extreme pressure lubricants or lube additives. More particularly, this invention relates to N- and N,N-disubstituted long chain aliphatic amides the acyl component of which is a normal, branched, or substituted alkenoic or alkanoic acyl group.

PATENT-3 737 426 Not available NTIS
Department of Agriculture, Washington, D.C.
BIODEGRADEABLE SURFACTANTS FROM STARCH-DERIVED GLYCOSIDES.
Patent,
Peter E. Throckmorton, David Aelony, Richard R. Egan, and Felix Otey. Filed 25 Sep 70, patented 5 Jun 73, 4p PAT-APPL-75 742,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Surfactants, *Glycosides, *Starches, *Epoxy compounds, Emulsifying agents, Polymers, Biodeterioration, Chemical reactions, Detergents, Carbohydrates, Sulfonic acids.
Identifiers: PAT-CL-260-210-R.

This invention relates to nonionic surface-active polymeric compounds and their corresponding ionic sulfate derivatives. It relates further to ether derivatives of ethoxylated and/or ethoxylated-propoxylated starch-derived glyional biodegradability, surface-tension lowering, wet-out promotion, and detergency. They are obtained by the chemical reaction of starch-derived ethylene and propylene polyol glycosides such as glycol and glycerol glycosides with ethylene and propylene oxides, long-chain epoxyalkanes, and chlorosulfonic acid.

PATENT-3 749 681 Not available NTIS
Department of Agriculture, Washington, D.C.
CATALYST FOR SELECTIVE HYDROGENATION OF POLYUNSATURATED VEGETABLE OILS.
Patent,
Sambasivarao Koritala. Filed 26 Feb 71, patented 31 Jul 73, 3p PAT-APPL-119 378,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Hydrogenation, *Catalysts, *Linolenates, Copper inorganic compounds, Life(Durability), Vegetable oils, Chemisorption, Silica gel.
Identifiers: PAT-CL-252-438.

A catalyst is described in the patent which will selectively reduce the linolenate moiety of polyunsaturated vegetable oils. The catalyst is particularly characterized as having excellent reuse properties. A procedure for the preparation of this highly active catalyst by chemisorption of copper-ammonium complex on silica gel is also described.

7D. Physical Chemistry

AD-776 320/4GA PC$3.00/MF$1.45
Rice Univ Houston Tex
ELECTRON SCAVENGING RESEARCH.
Annual rept. 1 Mar-31 Dec 73,
J. L. Franklin, and J. L. Margrave. Mar 74, 10p
Contract N00014-67-A-0145-0002

Descriptors: *Electron capture, *Anions, Phosphorus, Dissociation, Heat of formation, Resonance, Temperature, Fluorides, Chlorides.
Identifiers: *Electron affinity, Silicon tetrachloride.

Measurements have been made on the appearance potentials and translational energies of negative ions from a number of inorganic compounds. From these data it has been possible to deduce affinities and heats of formation of negative ions and, in some instances, free radicals. The studies have included SiCl4, P4, and chromium oxide. In a number of instances one of the fragments formed by dissociative resonance capture has been found to be electronically excited. (Modified author abstract)

AD-776 341/8GA PC$3.00/MF$1.45
Army Engineer Topographic Labs Fort Belvoir Va
TPLOT:A SIMPLE PROGRAM FOR PLOTTING PERCENT COMPOSITION DATA ON TERNARY DIAGRAMS.
Research note,
Thomas E. Eastler. Nov 73, 10p Rept no. ETL-RN-74-2

Descriptors: *Composition(Property), *Computer programs, Plotting, Diagrams.
Identifiers: TPLOT computer program, Hewlett-Packard 9810A programmable calculators, Ternary systems.

TPLOT directs the Hewlett-Packard 9810A programmable calculator and the 9862A plotter to plot points, on an equilateral ternary diagram, which represent designated percent compositions of three pure end-members: A, B, and C. Percent A and percent B are the only required data input to this program. Use of the TPLOT program provides a substantial savings of time and minimizes operator fatigue when compared with manual methods of plotting the same data. (Author)

AD-776 343/6GA PC$4.00/MF$1.45
Harry Diamond Labs Washington D C
ANALYSIS OF THE GROUND CONFIGURATION OF TRIVALENT THULIUM IN SINGLE-CRYSTAL YTTRIUM VANADATE,
Donald E. Wortman, Richard P. Leavitt, and Clyde A. Morrison. Dec 73, 19p Rept no. HDL-TR-1653

Descriptors: *Thulium, Solid state lasers, Yttrium compounds, Vanadates, Ions, Atomic energy levels, Single crystals, Spectrum analysis, Hyperfine structure.
Identifiers: Ligand fields, Spin lattice interactions, Yttrium vanadates.

An analysis has been made of the optical spectrum of Tm(3+) in YVO4. The approach taken was to describe the Tm(3+) free-ion energy levels as completely as possible and then to describe the effects of the crystal field on these levels. The results gave a new interpretation of the triplet H4 and triplet H5 multiplets and gave g factors in good agreement with the measurements. The effects of the hyperfine interaction and the spin-crystal-field interaction on the energy levels are discussed. (Modified author abstract)

AD-776 370/9GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
ADHESION OF ICE FROZEN FROM DILUTE ELECTROLYTE SOLUTIONS,
H. H. G. Jellinek. Mar 74, 13p Rept no. CRREL-RR-317

Descriptors: *Ice, *Adhesion, *Aluminum, Electrolytes, Deicing systems, Freezing, Salinity, Grain boundaries.

Experiments by Smith-Johannsen on the adhesion of ice frozen from a number of 0.001 M electrolyte solutions to a wax-treated aluminum surface at -10C are discussed. It is concluded that the adhesive strength measured by the force per square centimeter needed to shear the ice off the substrate surface is mainly due to a liquid interfacial solution layer between the ice and the substrate surface. The thickness of such a layer is largely determined by the same considerations as the thickness of grain boundary layers in ice obtained from dilute electrolyte solutions. (Author)

AD-776 375/8GA Reprint
City Coll New York Dept of Physics
SCALING RULE IN LOW-ENERGY ATOM-ATOM SCATTERING,
Marvin H. Mittleman. 13 Nov 72, 4p
Contract N00014-72-A-0406-0004
Availability: Pub. in Physical Review A, v7 n3 p1188-1190 Mar 73.

Descriptors: *Potential scattering, Helium, Cross sections, Atoms, Potential energy, Mathematical models.
Identifiers: *Atom atom interactions, Helium 3, Helium 4, Scaling laws.

An energy-scaling rule for atom-atom scattering is derived. The energy scaling depends upon the energy itself and on the interaction potential. The method is illustrated by the He-He scattering problem using the isotopes He3 and He4 in their three different combinations. (Modified author abstract)

AD-776 395/6GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
DETERMINATION OF WATER IN PYROTECHNIC MIXTURES BY GAS CHROMATOGRAPHY.
Technical rept. Apr-Jul 71,
John M. Bane. Mar 74, 19p Rept no. ED-TR-73044

Descriptors: *Gas chromatography, *Water, *Pyrotechnics, Accuracy, Mixtures, Chromatographic analysis, Solvent extraction, Sensitivity.

A procedure, using gas chromatography, has been developed for the analysis of water in pyrotechnic mixtures. Regression analysis of data indicated that with benzene as internal standard, weight of water could be determined to within plus or minus 0.001 gram in the examined range of 0.001 to 0.022 grams of water. Water was extracted from the pyrotechnic mix with absolute methanol. An internal standard (benzene or n-pentane) was added to the resultant slurry. After solids had settled, a sample of the clear liquid for resolution and analysis was injected into a gas chromatograph fitted with a Porapak Q filled column. Standard solutions, prepared with the same ratio of internal standard to methanol extract of pyrotechnic mix and various amounts of water, were resolved under similar conditions on the chromatograph. A calibration curve was prepared. (Modified author abstract)

AD-776 407/9GA PC$3.75/MF$1.45
Remtech Inc Huntsville Ala
PLUME INFRARED RADIATION CHARACTERISTICS.
Final rept.,
John E. Reardon, Gordon B. McKay, and Richard E. Somers. 15 Mar 74, 67p Rept no. RTR-013-2
Contract DAAH01-73-C-0252

Descriptors: *Plumes, *Infrared radiation, Computerized simulation, Alumina, Particles, Two phase flow, Water vapor, Carbon dioxide, Carbon monoxide, Carbon, Emission spectra, Rocket exhaust, Computer programs, Mathematical models, Hydrogen fluoride, Hydrogen chloride.
Identifiers: Performance evaluation.

An existing computer code which uses statistical band models with 25/cm wavenumber intervals was modified. The modified program predicts radiation for H2O, CO2, CO, HCl, HF, and carbon particles in rocket exhaust plumes. In addition an existing program for predicting two-phase flow (uncoupled) and radiation from Al2O3 particles was modified for operation on a CDC 6600 computer. (Modified author abstract)

AD-776 436/8GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
ELIMINATION OF THE DIFFUSE LAYER BY SPECIFIC ADSORPTION OF ANIONS ON MERCURY FROM DILUTE AQUEOUS SOLUTIONS,
Alan R. Sears, and Fred C. Anson. 25 May 73, 11p Rept no. Contrib-4655 AROD-3406.30-C
Grant DA-ARO-D-31-124-71-G119
Revision of report dated 12 Mar 73.
Availability: Pub. in Electroanalytical Chemistry and Interfacial Electrochemistry, v47 p521-531 1973.

Descriptors: *Adsorption, Anions, Surface properties, Electrolytes, Electrochemistry.
Identifiers: *Mercury electrodes, *Charge density, Electric potential.

The electronic surface charge density of mercury electrodes has been measured as a function of their potentials in solutions of NaF, NaN3, NaCl, KNO3, KI, and NaH2PO4 with Na2SO4 or LaCl3 added. Plots of the surface charge density vs. potential are indicative of anion adsorption and surface properties.

AD-776 443/4GA Reprint
Kansas State Univ Manhattan Dept of Chemistry
QUENCHING CROSS SECTIONS FOR ELECTRONIC ENERGY TRANSFER REACTIONS BETWEEN METASTABLE ARGON ATOMS AND NOBLE GASES AND SMALL MOLECULES,
L. G. Piper, J. E. Velazco, and D. W. Setser. 26 Apr 73, 20p AROD-9503.8-C
Grant DA-ARO-D-31-124-71-G127
Availability: Pub. in The Jnl. of Chemical Physics, v59 n6 p3323-3340, 15 Sep 73.

Descriptors: *Argon, *Quenching(Inhibition), Metastable state, Energy transfer, Reaction rates, Atomic energy levels, Krypton, Carbon monoxide, Nitrogen, Hydrogen, Methane, Cross sections.
Identifiers: Atom atom interactions, Atom molecule interactions.

Reaction rate constants for the quenching of electronic energy in metastable argon (triplet P) by Kr, Xe, and a number of simple molecules have been measured. A hollow, cold-cathode discharge excites the metastables in a flow apparatus. The concentration of metastables was followed by absorption spectroscopy as a function of time and of quenching molecule concentration. The quenching mechanism is discussed in terms of both a curve crossing and a 'golden rule' rate law; the latter appears to be favored. (Modified author abstract)

AD-776 447/5GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
RELATIVISTIC HARTREE-FOCK COMPTON PROFILES,
Lawrence B. Mendelsohn, Frank Biggs, and Joseph B. Mann. 1973, 15p
Contract N00014-67-A-0438-001
Prepared in cooperation with Sandia Labs., Albuquerque, N. Mex. and California Univ., Los Alamos, N. Mex. Los Alamos Scientific Lab.

Descriptors: *Compton scattering, *Uranium, Mathematical models, Computerized simulation, Atomic orbitals, Relativity theory, Electron density.
Identifiers: *Compton profiles.

Theoretical analysis and computer codes have been developed for calculating Compton profiles from numerical nonrelativistic and relativistic Hartree-Fock wave functions. Calculations are performed in uranium and results for nonrelativistic and relativistic electron densities, momentum distributions, and Compton profiles for individual orbitals are presented and compared. Cited profile results for other atoms indicate that relativistic calculations may be necessary for atoms of xenon or for even smaller atoms. (Modified author abstract)

AD-776 456/6GA Reprint
City Coll New York Dept of Physics
INVERSION-SYMMETRY-CHANGING ATOM-ATOM COLLISIONS,
Marvin H. Mittleman. 24 Aug 73, 4p
Contract N00014-72-A-0406-0004
Availability: Pub. in Physical Review A, v9 n2 p704-707 Feb 74.

Descriptors: *Wave functions, Parity, Cross sections, Atoms, Particle collisions.
Identifiers: *Atom atom interactions.

Slow collisions of different isotopes of the same species are considered. The adiabatic representation of wave functions is used. There is no restriction to inversion-symmetry-conserving collisions because of the isotopic difference. Such parity-changing collisions are considered and, since levels of different parity can cross, it is shown that the cross sections may be large. The 'switching functions,' previously used, are shown to play an important role in this reaction and their interpretation is discussed. (Author)

AD-776 461/6GA Reprint
City Coll New York Dept of Physics
LOW-ENERGY ATOM-ATOM SCATTERING: CORRECTIONS TO THE HE-HE INTERACTION,
Marvin H. Mittleman, and Hsiang Tai. 22 Mar 73, 13p
Contract N00014-72-A-0406-0004
Availability: Pub. in Physical Review A, v8 n4 p1880-1891 Oct 73.

Descriptors: *Helium, *Elastic scattering, Potential scattering, Isotopes, Mathematical models.
Identifiers: *Atom atom interactions.

A formalism, previously presented, for describing atom-atom scattering in the adiabatic representation to higher orders in m/M is generalized to describe the problem of different isotopes and different atoms. This is accomplished by a sequence of nonlinear coordinate transformations which introduce a 'switching function' which is defined only in the asymptotic limit of separated atoms. It is found that the effective potential for elastic scattering contains energy-dependent terms in order m/M and that it also depends upon the switching function in this order so that the potential is not unique. It is also found that in this order the definition of adiabatic states is not a trivial problem. A variational choice is made for the switching function and explicit calculations are presented for the He-He interaction. The coupled equations describing transitions are then derived and it is shown that terms are omitted from the usual coupling operator which are of the same order of magnitude as the one usually kept. This leads to a modification of the usual Landau-Zener transition formula. (Author)

AD-776 462/4GA Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics

PHOTOIONIZATION OF THE 2 SINGLET S AND 2 TRIPLET S STATES OF HELIUM,
K. L. Bell, A. E. Kingston, and I. R. Taylor. 19 Feb 73, 9p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics B. Atomic and Molecular Physics, v6 p2271-2279 Nov 73.

Descriptors: *Helium, *Photoionization, Hartree-Fock approximation, Dipoles, Atomic energy levels, Oscillators, Wave functions, Computations, Cross sections, Great Britain.
Identifiers: Oscillator strengths.

The continuous oscillator strengths for photoionization of the 2 singlet S and 2 triplet S states of helium are evaluated in the dipole length and velocity formulations for transitions which leave the He(+) ion in a 1s, 2s or 2p state. The calculations are performed with two sets of wavefunctions: Calculation A uses frozen core Hartree-Fock bound and free state functions; Calculation B uses a 56-parameter bound state representation with frozen core Hartree-Fock free state functions. Where possible the results are compared with the more accurate values of Jacobs and Burke. (Author)

AD-776 468/1GA Reprint
Queen'S Univ Belfast (Northern Ireland) School of Physics and Applied Mathematics
ROTATIONAL EXCITATION CROSS SECTIONS FOR E(-)-N2 SCATTERING,
N. Chandra, and P. G. Burke. 8 May 73, 3p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics B. Atomic and Molecular Physics, v6 p2355-2357 Nov 73.

Descriptors: *Nitrogen, *Electron scattering, Cross sections, Excitation, Molecular rotation, Molecular energy levels, Great Britain.
Identifiers: Rotational energy levels.

The rotational excitation cross sections for e(-)-N2 scattering for incident electron energies from 0.2 to 10.0 eV are calculated. Initial rotational levels up to 20 are considered. (Author)

AD-776 477/2GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Physics
ATOMIC L-SHELL COMPTON PROFILES AND INCOHERENT SCATTERING FACTORS: THEORY.
Progress rept.,
Benjamin J. Bloch, and Lawrence B. Mendelsohn. 19 Jun 73, 30p
Contract N00014-67-A-0438-0011
Availability: Pub. in Physical Review A, v9 n1 p129-155 Jan 74.

Descriptors: *Compton scattering, *Incoherent scattering, Theory, Spectrum analysis, Electrons, Atomic energy levels, Wave functions, Atomic orbitals.
Identifiers: Born approximation, *Compton profiles.

Compton profiles are calculated for L-shell electrons within the Born approximation by use of nonrelativistic 'exact' hydrogenic bound- and continuum-state wave functions. Impulse-approximation profiles are calculated, and comparisons with the 'exact' profiles show that, as expected, the two profiles lie very close to one another for weak binding and high incident photon energies. Integrated profiles (incoherent-scattering factors) are calculated and the impulse-approximation results agree with the 'exact' results over a wide range of binding energies owing to profile crossover near the center. (Modified author abstract)

AD-776 481/4GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
ELECTRODE KINETICS FOR A SIMPLE REDOX REACTION WITH ADSORBED REACTANT. THE REDUCTION OF CR(OH2)3(NCS)3 AT MERCURY ELECTRODES,
Fred C. Anson, and Robert S. Rodgers. 3 Feb 73, 25p Rept no. Contrib-4632 AROD-3406.29-C
Grant DA-ARO-D-31-124-71-G119
Availability: Pub. in Electroanalytical Chemistry and Interfacial Electrochemistry, v47 p287-309 1973.

Descriptors: *Reduction(Chemistry), *Chromium compounds, Cathodes(Electrolytic cell), Metal complexes, Reaction kinetics, Adsorption, Electrochemistry, Electrodes.
Identifiers: *Isothiocyanates, Chronocoulometry.

The results of measurements of the rate of reduction of adsorbed Cr(OH2)3(NCS)3 are reported and some of the special features that appear to be common to the electrode kinetics of all reactants when they are examined in the absorbed state are pointed out.

AD-776 483/0GA Reprint
Wisconsin Univ Madison Dept of Physics
EXCITATION OF UV FLUORESCENCE IN LAF3 DOPED WITH TRIVALENT CERIUM AND PRASEODYMIUM,
L. R. Elias, William S. Heaps, and W. M. Yen. 18 Jun 73, 10p AFOSR-TR-74-0284
Contract F44620-70-C-0029, Grant AF-AFOSR-1943-70
Availability: Pub. in Physical Review B, v8 n11 p4989-4995, 1 Dec 73.

Descriptors: *Fluorescence, *Cerium, *Praseodymium, *Emission spectra, Stark effect, Atomic energy levels, Doping, Ultraviolet spectra, Spectrum analysis, Absorption spectra.
Identifiers: Lanthanum fluorides, Transition probabilities.

The authors have investigated the excitation of uv and visible fluorescences in LaF3:Ce(3+) and LaF3:Pr(3+) pumped through the 5d and 6s bands of the impurity ion. They have also investigated the pumping bands in absorption. Several Stark components of the 5d bands of Ce(3+) and of Pr(3+) in LaF3 have been identified. Uv and visible emissions originating from the singlet S(0) state of the Pr(3+) ion a broad-band fluorescence (2700-4500A) in Ce(3+) are reported. Using the Judd-Ofelt theory the line strengths and transition probabilities for the 1SO emissions have been calculated. Lifetimes are reported. The threshold for stimulated emission in the transitions of LaF3:Pr(3+) has been calculated and the possibility of uv lasing is discussed. (Modified author abstract)

AD-776 501/9GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ADSORPTION OF OXYGEN AND ITS EFFECT ON CATHODE REDUCTION OF OXYGEN ON A NICKEL ELECTRODE IN AN ALKALINE SOLUTION (ADSORBTSIYA KISLORODA I EE VLIYANIE NA KATODNOE VOSSTANOVLENIE KISLORODA NA NIKELEVOM ELEKRODE V SHCHLOCHNOM RASTVORE),
C. P. Samoilov, V. A. Shumilova, E. I. Khrushcheva, and V. S. Bagotskii. 29 Aug 72, 4p Rept no. FSTC-HT-23-2203-72
Trans. of mono. Dvoinoi Sloi i Adsorbtsiya na Tverdykh Elektrodhkh i, Tartu, 1970 p333-339.

Descriptors: *Oxygen, *Adsorption, *Reduction(Chemistry), *Electrochemistry, Electrolytes, Cathodes(Electrolytic cell), Nickel, Electrodes, USSR, Translations.
Identifiers: Chemical reaction mechanisms.

Adsorption process and cathodic reduction of oxygen on a nickel electrode is investigated. The reduction of oxygen to OH(-) can occur directly or through intermediate formation of hydrogen peroxide. The branching ratio of the oxidation reduction reaction is studied. The effect of electrolyte composition and processing of the electrode surface on the branching ratio is investigated. (Author)

AD-776 506/8GA Reprint
Yale Univ New Haven Conn Dept of Engineering and Applied Science
VIBRATIONAL EXCITATION OF O2 BY ELECTRON IMPACT ABOVE 4 EV,
S. F. Wong , M. J. W. Boness, and G. J. Schulz. 20 Aug 73, 6p AROD-11041.2-P
Grant DA-ARO-D-31-124-73-G66
Sponsored in part by Defense Nuclear Agency.
Availability: Pub. in Physical Review Letters, v31 n16 p969-972, 15 Oct 73.

Descriptors: *Oxygen, Electron irradiation, Excitation, Molecular vibration, Molecular energy levels, Cross sections, Resonance.
Identifiers: Vibrational energy levels.

Vibrational excitation of O2 by electrons in the energy range 4-15 eV is studied with a crossed-beam double electrostatic analyzer. The differential vibrational cross sections for v = 1-4 at 25C show a bell-shaped energy dependence peaked near 9.5 eV. The observations are interpreted in terms of resonant contributions by excited states of O2. There is also evidence for the resonant enhancement of electronic excitations. (Author)

AD-776 511/8GA Reprint
Boston Coll Chestnut Hill Mass Dept of Chemistry
SPECTROSCOPIC STUDIES OF LOW-PRESSURE HYDROGEN-FLUORINE FLAMES,
D. I. Mac Lean, and G. W. Tregay. 1972, 11p
AFOSR-TR-74-0231
Contract N00014-69-A-0453, Grant AF-AFOSR-1523-68
Availability: Pub. in Proceedings of Symposium (International) (14th) on Combustion, Pa. State Univ., p157-165 20-25 Aug 72.

Descriptors: *Hydrogen, *Fluorine, *Flames, Dissociation, Molecular rotation, Molecular vibration, Molecular spectroscopy, Combustion, Molecular energy levels, Chain reactions, Emission spectra.
Identifiers: *Hydrogen fluoride, Chemical reaction mechanisms.

A spectroscopic study of argon-diluted and pure hydrogen-fluorine flames was carried out at pressures of 2-4 torr on an aluminum multidiffusion burner. A total of 21 vibration-rotation bands of HF were observed between 450 and 1200 nm. Vibrational and rotational temperature profiles of each flame were determined from the observed emission intensity of lines in the P-branch of the 3-0 band and vibration-rotation interaction factors from the literature. A flame model in which the collisional dissociation of vibrationally excited hydrogen fluoride, HF*+M to H+F+M, is assigned a major role in the chain-reaction mechanism, appears to satisfactorily explain the experimental data. (Modified author abstract)

AD-776 518/3GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
POLARIZED ELECTRONIC SPECTRA OF TETRACYANONICKELATE (II) AT 5K,
Charles D. Cowman, C. J. Ballhausen, and Harry B. Gray. 11 Jul 73, 5p Rept no. Contrib-4197 AROD-8389.10-C
Grant DA-ARO-D-31-124-72-G116
Prepared in cooperation with Orsted Inst. Universitetsparken, Copenhagen, Denmark. Chemical Lab.
Availability: Pub. in the Jnl. of the American Chemical Society, v95 n23 p7873-7875, 14 Nov 73.

Descriptors: *Metal complexes, *Nickel compounds, *Ultraviolet spectra, *Cyanides, Band structure of solids, Spectrum analysis, Cryogenics, Absorption spectra, Polarization, Electron transitions.

The authors obtained optically dilute single crystals of ((n-C4H9)4N)2(Ni(CN)4). They report results and conclusions of an investigation of absorption band polarization in the ultraviolet region at liquid helium temperature.

AD-776 522/5GA Reprint
Boston Coll Chestnut Hill Mass Dept of Chemistry
DISSOCIATION OF DIATOMIC MOLECULES. I. EFFECT OF LIMITED NUMBERS OF ROTATIONAL STATES,
G. W. Tregay, W. G. Valance, and D. I. MacLean.
15 Jan 73, 9p AFOSR-TR-74-0230
Grant AF-AFOSR-1523-68
Availability: Pub. in Jnl. of Chemical Physics, v59 n4 p1634-1640, 15 Aug 73.

Descriptors: *Diatomic molecules, *Dissociation, Particle collisions, Models, Reaction rates, Molecular energy levels, Hydrogen.
Identifiers: Vibrational energy levels, Rotational energy levels, Hydrogen fluoride, Molecule molecule interactions.

The rate of dissociation of a diatomic molecule is derived from a simple collision model. The diatomic molecule is treated as a rotating vibrator with a limited number of allowed rotational states in the upper vibrational levels. It is found that the dissociation rate depends strongly on the collisional dissociation probability but the activation energy does not. The model is applicable to situations where there is a Boltzmann translational energy distribution and a nonequilibrium vibrational distribution characterized by a vibrational temperature. The dissociation rates of H2 and HF are considered as specific examples. (Modified author abstract)

AD-776 532/4GA Reprint
New York Univ N Y Dept of Physics
COHERENT TRANSIENT STUDY OF VELOCITY-CHANGING COLLISIONS,
J. Schmidt, Paul R. Berman, and Richard G. Brewer. 22 Aug 73, 6p AROD-10895.1-P
Grant DA-ARO-D-31-124-73-G128
Prepared in cooperation with IBM Research Lab., San Jose, Calif., under Contract N00014-72-C-0153. Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in Physical Review Letters, v31 n18 p1103-1106, 29 Oct 73.

Descriptors: *Gases, Coherent optical radiation, Cross sections, Particle collisions, Molecules, Stark effect, Velocity.
Identifiers: *Molecule molecule interactions, *Line narrowing.

The effect of velocity-changing collisions on the optical phase memory of coherently prepared molecular gas samples is examined by the method of Stark-pulse switching. Experiments are interpreted through the solution of a transport equation, which extends for the earlier Fokker-Planck description known both in NMR and Dicke line narrowing. The magnitude of a characteristic velocity jump for binary molecular collisions and its cross section are thereby obtained. (Author)

AD-776 570/4GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PROBLEM OF METALLIC HYDROGEN,
Isaac Khalatnikov. 27 Dec 73, 8p Rept no. FSTC-HT-23-2494-72
Trans. of Priroda (USSR) n10 p8-11 1971, by Trombley.

Descriptors: *Hydrogen, Cryogenics,, Crystal structure, Translations, USSR.
Identifiers: *Metallic hydrogen.

The report concerns experimental programs investigating metallic hydrogen. Methods of producing metallic hydrogen are described.

AD-776 584/9GA PC$3.75/MF$1.45
Utah Univ Salt Lake City Div of Materials Science and Engineering
DIFFUSION OF HYDROGEN AND DEUTERIUM IN RUTILE.
Doctoral thesis,
Su-Hyon Paek. 4 May 74, 72p

Descriptors: *Diffusion, *Rutile, *Hydrogen, *Deuterium, Temperature, Electric fields, Impurities, Crystal structure, Bonding, Theses.

The effect of internal electric fields, due to changing concentration of a diffusing ion, on the measured diffusion rate is considered. It is shown that the effect of such fields can completely dominate the diffusion process in a material like TiO2, leading to dramatic departures from Fick's law. An isotope exchange technique is described, which almost completely suppresses the internal fields and hence permits accurate determination of the real diffusion parameters. This technique has been applied to the diffusion of H and D in TiO2 and accurate values of all diffusion parameters for diffusion parallel and perpendicular to the c-axis have been obtained. The diffusion appears to be a simple thermally activated process over a wide range of temperatures, with activation energies of 0.59 and 1.28 eV, for diffusion parallel and perpendicular to the c-axis, respectively. Large departures from Fick's law behavior for single diffusion have also been demonstrated. (Author)

AD-776 604/1GA PC$4.00/MF$1.45
Naval Research Lab Washington D C
ON THE MATHEMATICAL TREATMENT OF ANALYTICAL FUNCTIONS IN SPECTROCHEMICAL MULTICOMPONENT ANALYSIS,
H. Kaiser. 26 Mar 74, 9p Rept no. NRL-Trans-1286
Trans. of mono. Ueber die Behandlung von Analysenfunktionen bei Spektrochemischen Mehrkomponenten-Analysen, Dormund, by Richard S. Relac and John W. Criss.

Descriptors: *Spectrum analysis, Data reduction, Errors, Chemical composition, Calibration, Matrices(Mathematics), Translations, West Germany.
Identifiers: Spectrochemical analysis.

Common aspects in the mathematical treatment of the analytical functions occuring in multicomponent analysis are considered. The starting point is the idea of a mapping process correlating points in the 'space of the chemical constitution' to points in the 'space of the measures'. The system of functions which performs this mapping in the case of calibration can be represented locally by the 'calibration matrix'. These systems of functions must be linearized in order to solve the calibration problem practically and economically in the case of procedures which are not completely selective. The usefulness of surplus (e.g. redundant) measurements in a spectrum, with respect to accuracy and precision, is touched and also the propagation of systematic and random errors throughout the inversion of the calibration matrix.

AD-776 614/0GA PC$3.25/MF$1.45
Purdue Univ Lafayette Ind Project Squid Headquarters
TEMPERATURE AND CONCENTRATION MEASUREMENTS ON AN AXISYMMETRIC JET AND FLAME.
Technical rept.,
Samuel Lederman, and J. Bornstein. Dec 73, 46p Rept no. SQUID-TR-PIB-32-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Polytechnic Inst. of Brooklyn, Farmingdale, N.Y.

Descriptors: *Axially symmetric flow, *Raman spectroscopy, Mixing, Profiles, Chemical composition, Light scattering, Flames, Turbulent flow, Temperature, Flow fields, Carbon dioxide, Oxygen.
Identifiers: *Raman scattering, Axisymmetric jets, Squid project.

The application of Raman scattering to the determination of concentration profiles of a turbulent isothermal mixing jet is discussed. Temperature measurements in a flow field using the Raman scattering techniques are investigated. Problems involved in these measurements are discussed. Experimental specie concentration data obtained on an isothermal turbulent axisymmetric mixing jet are presented. Temperature profiles of an axisymmetric methane flame, using one of the Raman techniques, are obtained and discussed. Some problems concerning LDV and high frequency turbulence measurements are indicated. (Author)

AD-776 618/1GA PC$6.75/MF$1.45
National Academy of Sciences Washington D C Committee on Hazardous Materials
BULK TRANSPORTATION OF HAZARDOUS MATERIALS BY WATER IN THE FUTURE - A LONG-RANGE FORECAST.
Jul 73, 283p* USCG-D-61-74
Contract DOT-CG-11775-A
Proceedings of Conference Held at College Park, Md., 9-10 Jul 73.

Descriptors: *Hazards, *Transportation, Forecasting, Rail transportation, Shipping, Marine transportation, Ships, Cargo, Safety, Risk, Tankers, Submarines, Petroleum products, Water pollution.
Identifiers: Hazardous materials transportation, Insurance.

Contents: Future energy needs; trends in world shipping; railway transport of hazardous materials; highway transport of hazardous materials; water transportation of petroleum and petroleum products in the future; predicting ocean pollutants; vessels for special cargoes; new concepts for bulk cargo vessels; hull underwriting and the changing technology; future ports--onshore and offshore; experimental basis for control of vessels by satellite; control systems for vessels - open sea and harbor; floating superport; hazardous materials flow in intercoastal waterways--a case study of risk-exposure factors for the future of a specific area; human error in merchant marine safety; practical problems in technology assessment: a telecommunications example; future risk analysis techniques; institutional and technical problems in risk analysis; summary of conference.

AD-776 650/4GA PC$3.25/MF$1.45
General Electric Co Philadelphia Pa Space Div
DEFENSE NUCLEAR AGENCY REACTION RATE HANDBOOK. SECOND EDITION. REVISION NUMBER 3,
M. H. Bortner, R. H. Kummler, and T. Baurer. 1 Sep 73, 48p DNA-1948H-Rev-3
Contracts DASA01-70-C-0082, DASA01-71-C-0145
Prepared in cooperation with Wayne State Univ., Detroit, Mich. Complete revision of Chapt. 24, Summary of Suggested Rate Constants. See also report dated Nov 72, AD-764 303 and report dated Mar 72, AD-763 699.

Descriptors: *Atmospheric chemistry, Dissociation, Upper atmosphere, Molecules, Reaction kinetics, Photochemical reactions, Gas ionization, Ions, Atoms, Chemical reactions, Oxygen, Nitrogen, Nitrogen oxides, Water, Ozone, Hydrogen.
Identifiers: *Reaction rates, Recombination reactions.

This chapter presents a summary of reactions, with suggested rate coefficients, relevant to the problems of atmospheric chemical recovery following a perturbation.

AD-776 652/0GA PC$3.00/MF$1.45
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab

RELATING GEOMETRICAL VARIABLES OF POROUS ELECTRODES.
Technical rept.,
T. Katan, and H. F. Bauman. 28 Feb 74, 19p Rept nos. LMSCI-D358403, TR-2
Contract N00014-73-C-0397

Descriptors: *Porous materials, *Electrodes, Geometry, Mathematical models, Filaments, Porous metals.

A filamentary model of a porous mass is developed to show how geometrical variables are mutually related and can act as a guide in design and fabrication of porous battery electrodes. (Author)

AD-776 665/2GA PC$3.25/MF$1.45
Utah Univ Salt Lake City Dept of Chemistry
BRILLOUIN AND RAYLEIGH SCATTERING IN POLYBUTADIENE.
Technical rept. no. 5, 1 Apr 73-31 Mar 74,
Y. Y. Huang, and C. H. Wang. 22 Mar 74, 27p
Contract N00014-67-A-0325-0007

Descriptors: *Polybutadiene, *Rayleigh scattering, Phonons, Hypersonic characteristics, Glass, Phase studies, Spectral lines, Depolarization, Brillouin zones, Variations, Density.
Identifiers: *Brillouin scattering, Krishnan effect.

The molecular light scattering of polybutadiene from 110 to 350K was carried out. The study includes the measurements of Brillouin shift, Brillouin linewidth and Rayleigh depolarization ratios as a function of temperature. It has been found that the hypersonic frequency displays a discontinuity at the glass temperature Tg. The hypersonic attentuation coefficient over one wavelength has also been determined as a function of temperature. No quantitative theory has been found to be able to describe the sound attenuation above Tg. The Krishnan effect was also observed below 250K. This is the first experiment which observes the evolution of the Krishnan effect. It has been pointed out that the frozen-in density fluctuation mechanism fails to explain the effect. The frozen-in fluctuations of the dielectric anisotropy is suggested to be a possible mechanism for the Krishnan effect. (Modified author abstract)

AD-776 673/6GA PC$3.25/MF$1.45
Aerochem Research Labs Inc Princeton N J
KINETICS OF AL ATOM OXIDATION.
Final rept. 1 May 72-31 Aug 73,
Arthur Fontijn, William Felder, and James J. Houghton. Sep 73, 34p Rept no. AeroChem-TP-299 DNA-3242F
Contract DNA001-72-C-0206, ARPA Order-1433
Supersedes report dated Nov 72, AD-756 644.

Descriptors: *Aluminum, *Oxidation, Atoms, Metal vapors, Reaction rates, Reaction kinetics, Gases, Oxygen, Laboratory equipment.
Identifiers: Gas phase.

The kinetics of the Al/O2 reaction system has been studied with the AeroChem high-temperature fast-flow reactor (an adaptation of the steady-state flow reactor suitable for measurements at temperatures up to 2000K). The rate coefficient for the homogeneous gas-phase reaction Al + O2 to AlO + O has been determined. Evidence for a zero-order and a first order wall Al-oxidation process were also obtained. Comparison is made to other metal atom oxidations. (Modified author abstract)

AD-776 690/0GA Reprint
Marquette Univ Milwaukee Wis
INFRARED STUDIES OF COORDINATION COMPOUNDS CONTAINING HIGH OXIDATION-STATE METALS. I. DIARSINE COMPLEXES,
Kazuo Konya, and Kazuo Nakamoto. 5 Feb 73, 10p AROD-8575.3-C
Grant DA-ARO(D)-31-124-G1130
Availability: Pub. in Spectrochimica Acta, v29A p1965-1973 1973.

Descriptors: *Metal complexes, *Arsines, *Infrared spectra, Platinum compounds, Palladium compounds, Cobalt compounds, Molecular vibration, Nickel compounds, Iron compounds, Spectrum analysis.

Infrared spectra of diarsine(dias) complexes of the types, (M(dias)2)X2 (M = Ni(II), Co(II), Pd(II) and Pt(II), and X = Cl, Br or ClO4), (MX2(dias)2)Yn (M = Ni(III), Ni(IV), Fe(II), Fe(III) and Fe(IV), X = Cl and Br, Y = Cl, Br, ClO4 or BF4, and n = 0, 1 or 2) have been measured. The M--X and M--As stretching vibrations have been assigned based on isotopic shifts due to the 58Ni-62Ni or 54Fe-57Fe substitution. The M--As stretching bands are very weak. (Modified author abstract)

AD-776 717/1GA Reprint
Marquette Univ Milwaukee Wis
METAL ISOTOPE EFFECT ON METAL-LIGAND VIBRATIONS,
Kazuo Nakamoto. 4 Jan 72, 11p AROD-8575.4-C
Grants DA-ARO-D-31-124-72-G6, DA-ARO(D)-31-124-G1130
Availability: Pub. in Angewandte Chemie, v11 n8 p666-674 Aug 72.

Descriptors: *Metal complexes, *Molecular vibration, Raman spectra, Infrared spectra, Ligands, Spectrum analysis, Molecular energy levels.
Identifiers: *Isotope effect.

Exploitation of the isotope effect using heavy metal isotopes now makes it possible to give clear-cut assignments of the metal-ligand vibrations in the IR and Raman spectra of complex compounds. The results previously obtained with this new method and their current limitations form the subject of this progress report. (Author)

AD-776 718/9GA Reprint
Duke Univ Durham N C Dept of Physics
MILLIMETER AND SUBMILLIMETER WAVE SPECTRUM OF (18)O2,
Wayne Steinbach, and Walter Gordy. 30 May 73, 6p AROD-9491.10-P
Grants DA-ARO-D-31-124-72-G96, NSF-GP-34590
Availability: Pub. in Physical Review A, v8 n4 p1753-1758 Oct 73.

Descriptors: *Oxygen, *Microwave spectroscopy, Isotopes, Millimeter waves, Submillimeter waves.
Identifiers: *Oxygen 18.

Fine-structure transitions in the millimeter wavelength region and the n(J) = 1(2) to 3(2) submillimeter wavelength rotational transition have been measured with high precision. The submillimeter radiation was generated by a harmonic multiplier and detected by a silicon bolometer operated at 1.5K. (Modified author abstract)

AD-776 723/9GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
THE EVALUATION OF SURFACE ACTIVITIES FROM ADSORPTION ISOTHERMS AND THEIR UTILIZATION IN KINETIC ANALYSES OF ELECTRODE REACTIONS,
Fred C. Anson. 3 Mar 73, 9p Rept no. Contrib-4651 AROD-3406.28-C
Grant DA-ARO-D-31-124-71-G119
Availability: Pub. in Electroanalytical Chemistry and Interfacial Electrochemistry, v47 p279-285 1973.

Descriptors: *Surface chemistry, Surface reactions, Reaction kinetics, Adsorption, Electrodes.
Identifiers: *Activity coefficients.

The kinetic equivalence of two alternative approaches for defining the surface activity coefficients of adsorbed reactants is demonstrated. A third, commonly used approach, which avoids the introduction of non-unit activity coefficients is also shown to yield kinetically indistinguishable results. It is argued that the definition of surface activity used in a recent kinetic study involving adsorbed reactants was inappropriate. The effects of making a kinetic analysis of the same system using modified expressions for surface activities are described.

AD-776 805/4GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
SMALL-SIGNAL-GAIN AND TIME-RESOLVED SPECTROSCOPY OF THE D2-F2/CO2 PULSED CHEMICAL TRANSFER LASER SYSTEM.
Rept. for Mar-Apr 72,
Steven N. Suchard. 15 Mar 74, 15p Rept no. TR-0074(4641)-4 SAMSO-TR-74-56
Contract F04701-73-C-0074

Descriptors: *Carbon dioxide lasers, *Hydrogen fluoride, Molecular energy levels, Molecular vibration, Deuterium compounds, Excitation, Optical pumping, Energy transfer, Reaction kinetics.
Identifiers: Time resolved spectroscopy, Rotational energy levels.

The authors report measurements of the small-signal-gain and time-resolved spectral output of a flash-initiated D2-F2/CO2 chemical transfer laser system. Small-signal-gain measurements indicate a possible lack of rotational equilibration among the rotational levels of the CO2 during the DF-CO2 v-v energy transfer process. Time-resolved spectral output of this system, operated as a laser oscillator, is presented as verification of the small-signal-gain results. (Modified author abstract)

AD-776 816/1GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
TEMPERATURE DEPENDENCE OF VIBRATIONAL ENERGY TRANSFER FROM DF(V=1) TO SEVERAL DIATOMICS.
Rept. for Jul 72-Jul 73,
Jerry F. Bott. 11 Mar 74, 38p Rept no. TR-0074(4530)-8 SAMSO-TR-74-55
Contract F04701-73-C-0074

Descriptors: *Energy transfer, *Diatomic molecules, Fluorides, Temperature, Oxygen, Molecular vibration, Reaction kinetics, Deuterium compounds, Nitrogen, Carbon monoxide.
Identifiers: *Deuterium fluoride, Hydrogen bromide, Hydrogen chloride, Nitrogen oxide(NO), Hydrogen fluoride.

The V-V energy transfer rates from DF (v = 1) to HCl, HBr, DBr, D2, N2, O2, CO, and NO were measured at temperatures from 295 to 800K. The measurements were made behind reflected shock waves with the laser-induced fluorescence technique. Several rates of V-R, T deactivation by DF were also obtained. (Modified author abstract)

AD-776 817/9GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
VIBRATIONAL ENERGY EXCHANGE OF THE DF(V = 2) STATE WITH DF(V = 0).
Rept. for Feb-May 73,
Jerry F. Bott. 5 Mar 74, 21p Rept no. TR-0074(4530)-7 SAMSO-TR-74-50
Contract F04701-73-C-0074

Descriptors: *Energy transfer, Reaction kinetics, Molecular vibration, Molecular energy levels, Fluorides, Deuterium compounds.
Identifiers: *Deuterium fluoride, Laser induced fluorescence.

The energy transfer rate for the reaction DF(v = 1) + DF(v = 1) = DF(v = 0) + DF(v = 2) was studied in a combined shock-tube laser-induced fluorescence experiment at temperatures from 295 to 720K. The rate coefficient for the exothermic reaction was found to vary as 1/T when expressed in units of cc/mole . sec. (Modified author abstract)

AD-776 832/8GA Reprint
Texas Univ Austin Electronics Research Center
SELF-INDUCED TRANSPARENCY WITH CO2 LASER PULSES IN AMMONIA GAS,
C. D. David, and W. M. Clark. 11 Jun 73, 3p
AFOSR-TR-74-0436
Contract F44620-71-C-0091
Availability: Pub. in Applied Physics Letters, v23 n6 p306-308, 15 Sep 73.

Descriptors: *Ammonia, *Absorption(Physical), *Laser beams, Carbon dioxide lasers, Infrared lasers, Light transmission, Stark effect.
Identifiers: Self induced transparency.

Self-induced transparency effects, namely pulse delay and nonlinear transmission, are observed at two CO2 laser line and Stark-tuned NH3 absorber transition resonances; these are the P(32) CO2 laser line and the asQ(5,3,5) NH3 transition with a Stark field of 12.3 kV/cm at 10.7 micrometers and the R(6) CO2 laser line and the saQ(5,5,5) NH3 tuned with a 14.6-kV/cm field at 10.3 micrometers. (Author)

AD-776 858/3GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
EVAPORATION IN A VAPOR-GAS MIXTURE,
Young-ping Pao. 8 May 72, 4p AFOSR-TR-74-0448
Grant AF-AFOSR-2053-71
Availability: Pub. in Jnl. of Chemical Physics, v59 n12 p6688-6689, 15 Dec 73.

Descriptors: *Evaporation, *Vapors, *Drops, Mixtures, Gases, Knudsen number.

The evaporation problem is considered from a kinetic-theoretic viewpoint for pure vapors and vapor-gas mixtures in planar geometries. The result is applied to the droplet problem at small Knudsen numbers. The rate of evaporation from a droplet in a mixture is calculated to second order in the Knudsen number. (Modified author abstract)

AD-776 863/3GA Reprint
Florida Univ Gainesville Dept of Chemistry
ELECTRONIC QUENCHING OF ALUMINUM AND GALLIUM ATOMS ISOLATED IN RARE GAS MATRICES,
John H. Ammeter, and David C. Schlosnagle. 23 Mar 73, 40p AFOSR-TR-74-0401
Grant AF-AFOSR-2208-72
Availability: Pub. in Jnl. of Chemical Physics, v59 n9 p4784-4820, 1 Nov 73.

Descriptors: *Aluminum, *Gallium, *Complex compounds, Crystal lattices, Ultraviolet spectra, Cryogenics, Electron paramagnetic resonance, Spectrum analysis, Molecular orbitals, Atomic energy levels, Coupling(Interaction), Quenching(Inhibition), Electron transitions, Rare gases.
Identifiers: Matrix isolation techniques, *Rare gas compounds, Jahn-Teller effect, Crystal fields.

Optical and ESR spectra are reported for aluminum and gallium in rare gas matrices at 4.2K. Data are analyzed and discussed with regard to Jahn-Teller effects, orbital overlap and coupling, splittings, lattice symmetries, and quenching.

AD-776 869/8GA Reprint
Ohio State Univ Columbus Dept of Chemistry
THEORY OF ELECTRONICALLY NON-ADIABATIC CHEMICAL REACTIONS: QUANTUM MECHANICAL FORMULATION OF COLLINEAR REACTIONS,
H. Nakamura. 12 Jan 73, 22p AFOSR-TR-74-0394
Grant AF-AFOSR-2272-72
Availability: Pub. in Molecular Physics, v26 n3 p673-692 1973.

Descriptors: *Chemical reactions, Approximation, Quantum theory, Green's function, Wave functions, Electron transitions, Particle collisions.

An electronically non-adiabatic collinear chemical reaction is investigated theoretically. The problem is formulated quantum mechanically in a close-coupling form by using a curvilinear coordinate system and an expansion in terms of vibrational wave functions. A rigorous expression for the non-adiabatic transition matrix is obtained in terms of the Green's function for the matrix operator. An adiabatic distorted wave approximation with respect to the electronic transition is discussed which incorporates the vibrational coupling and is expected to be a good approximation in low energy collisions. On the basis of this approximation, the mechanism of electronically non-adiabatic reactions is discussed qualitatively. (Author)

AD-776 870/8GA Reprint
Columbia Univ New York Dept of Chemistry
CROSSED-BEAM REACTIONS OF BARIUM WITH HYDROGEN HALIDES. MEASUREMENT OF INTERNAL STATE DISTRIBUTIONS BY LASER-INDUCED FLUORESCENCE,
Richard N. Zare, Howard W. Cruse, and Paul J. Dagdigian. 22 Jan 73, 19p AFOSR-TR-74-0389
Contract N00014-67-A-0108-0035, Grant AF-AFOSR-2275-72
Availability: Pub. in Faraday Discussions of The Chemical Society, n55 p277-292 1973.

Descriptors: *Barium, Cross sections, Chemical reactions, Barium compounds, Molecular beams, Molecular energy levels, Hydrogen fluoride, Hydrogen chloride, Molecular vibration, Excitation.
Identifiers: *Laser induced fluorescence, *Hydrogen halides, Atom molecule interactions, Barium halides.

The use of laser-induced fluorescence as a molecular beam detector for the measurement of internal state distributions of reaction products is presented and applied to the reactions of barium with the hydrogen halides. It is found that most of the reaction exoergicity appears as translational energy of the products and that the total reactive cross section is positively correlated with the average fraction of the exoergicity appearing as vibrational excitation. (Author)

AD-776 878/1GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Aeronautics and Astronautics
SCATTERING OF MONOENERGETIC ARGON BEAMS FROM HEATED PLATINUM: OUT-OF-PLANE TIME-OF-FLIGHT MEASUREMENTS,
Arthur R. Rudnicki, Jr., and Harold Y. Wachman. 14 Jun 72, 17p AFOSR-TR-74-0442
Contract F44620-71-C-0006
Revision of report dated 5 May 72.
Availability: Pub. in Surface Science, v34 n3 p679-692 Feb 73.

Descriptors: *Argon, *Atomic beams, Distribution, Scattering, Atoms, Platinum, Surfaces, Velocity, Energy, Surface roughness, Flux(Rate).
Identifiers: Gas surface interactions, Time of flight spectroscopy.

Time-of-flight measurements were made in and out of the plane of incidence, with initially monoenergetic argon beams before and after reflection from heated platinum. The data were used to compute low order moments of velocity distribution: relative number flux, momentum and energy flux. Flux ratios yield mean speed, mean energy and speed distribution as functions of angle of reflection. The data are consistent with the hypotheses that the tangentical component of momentum of the incident beam is nearly preserved on collision and that dispersion out of the plane of incidence is caused by surface roughness. (Modified author abstract)

AD-776 879/9GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
RATES OF TERMINATION OF RADICALS IN SOLUTION. VII. ALLYLIC RADICALS,
Heinz J. Hefter, Chin-Hua S. Wu, and George S. Hammond. 30 Jun 72, 7p Rept no. Contrib-4486
AFOSR-TR-74-0381
Grant AF-AFOSR-1958-71
See also report dated 9 Aug 71, AD-748 124.
Availability: Pub. in Jnl. of the American Chemical Society, v95 n3 p851-855 Feb 73.

Descriptors: *Free radicals, Decay, Propenes, Alkenes, Photolysis, Electron paramagnetic resonance, Reaction kinetics, Diffusion, Viscosity.
Identifiers: *Allylic radicals, Butenes, Reaction rates.

The rate constants for bimolecular decay of allyl, 2-methallyl, and cis- and trans-1-methallyl radicals in liquid propene, isobutene, and cis- and trans-2-butene, respectively, have been determined over a wide temperature range from near the boiling points of the solvents to about -120C using the esr-rotating sector technique. The values were compared with the encounter rate constants calculated from density and viscosity data. The self-termination of allyl, 2-methallyl, and trans-1-methallyl radicals fits the diffusion-controlled model. However, the rate constant for the cis-1-methallyl radical is unexpectedly high at the higher temperatures. The viscosities of liquid propene, isobutene, and cis- and trans-2-butene between their boiling points and -100C are reported. (Modified author abstract)

AD-776 887/2GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SOME ONE-DIMENSIONAL FLOW PROBLEMS FOR A TWO-PHASE GAS-VAPOR-LIQUID MIXTURE,
Yu. N. Vasilev. 11 Mar 74, 40p Rept no. FTD-HT-23-677-74
Edited trans. of Lopatochenye Mashiny i Struynye Apparaty. Sbornik Statei (USSR) n6 p179-201 1972, by Marilyn Olaechea.

Descriptors: *Gases, *Liquids, *Ejectors, Numerical analysis, Thermodynamics, Translations, USSR.

The report discusses a theory concerning a two-phase gas-liquid ejector.

AD-776 936/7GA PC$3.25/MF$1.45
Army Medical Bioengineering Research and Development Lab Aberdeen Proving Ground Md
SAMPLING METHODOLOGY AND ANALYTICAL PROCEDURES FOR AMBIENT SULFUR HEXAFLUORIDE.
Final rept.,
Susan K. Luckan, and William R. Mura. Feb 74, 26p Rept no. TR-7401

Descriptors: *Gas detectors, Gas analysis, Sampling, Sulfur compounds, Fluorides, Gas chromatography, Sensitivity.
Identifiers: *Sulfur hexafluoride, *Air pollution detection.

An evaluation of sampling techniques and gas chromatographic analysis for low levels of sulfur hexafluoride (SF6) was conducted to verify that laboratory procedures were sufficiently sensitive for use of SF6 in optimizing the location and use of air quality sampling stations of air monitoring networks. A Tracor-550 gas chromatograph was used; it was equipped with a nickel(63) electron capture detector, and pulsed mode as well as d.c. polarized voltage capabilities. Sampler and container materials are discussed. (Modified author abstract)

AD-776 990/4GA PC$4.75/MF$1.45
Rice Univ Houston Tex
THERMODYNAMIC AND KINETIC DATA OF CARBON-FLUORINE COMPOUNDS.
Final rept. 1 Nov 72-31 Dec 73,

A. J. Valerga, R. B. Badachhape, G. D. Parks, P. Kamarchik, and J. L. Wood. Mar 74, 35p ECOM-0056-F-73
Contract DAAB07-73-C-0056

Descriptors: *Electrochemistry, *Thermochemistry, Thermodynamics, Cryogenics, Entropy, Enthalpy, Calorimetry, Reaction kinetics, Surfaces, Solids, Specific heat, Tables(Data), Heat of formation.
Identifiers: *Graphite fluorine clathrates, Lithium cells, Surface area.

Samples of the solid fluorocarbons CF(0.597) and CF(0.2369) have been prepared and studied to learn more about their thermodynamic properties. Low temperature heat capacity measurements have been made for both of these samples using a hydrogen cryostat calorimeter. Smoothed thermodynamic functions have been calculated for these compounds over the 20-300K temperature range. Heats of formation have been determined by fluorine bomb calorimetry. This data permits the calculation of a value of E(0) for the electrochemical processes CF(0.2369)(s) + 0.2369 Li (s) to 0.2369 LiF(s) + C (s) and CF(0.597(s) + 0.597 Li (s) to 0.597 LiF(s) + C (s). In order to gather fundamental data to explain the kinetics of the cathode reaction in cells using CFx (where X = 0.6 to 1.1, or higher), surface area measurements were made on the samples CF(1.12), CF(0.597) and CF(1.17). (Modified author abstract)

AD-777 026/6GA Reprint
California Inst of Tech Pasadena Gates and Crellin Labs of Chemistry
ROLE OF CHARGE TRANSFER INTERACTIONS IN THE QUENCHING OF 1,4-DIMETHOXYBENZENE FLUORESCENCE.
F. A. Carroll, M. T. McCall, and G. S. Hammond. 8 Feb 72, 6p Rept no. Contrib-4422 AFOSR-TR-74-0396
Grant AF-AFOSR-1958-71
Availability: Pub. in Jnl. of the American Chemical Society, v95 n2 p315-318 Jan 73.

Descriptors: *Quenching(Inhibition), *Charge transfer, *Fluorescence, Reaction kinetics, Excitation, Phenyl ethers.
Identifiers: *Benzene/dimethoxy.

The fluorescence of 1,4-dimethoxybenzene (DMB) in acetonitrile is quenched by a number of organic compounds having lowest lying excited singlets higher in energy than that of DMB. The rate constants show a structure-reactivity pattern that seem to implicate charge transfer as an integral part of the quenching process. The group as a whole does not show a linear correlation of log k(q) with quencher reduction potentials, even though a limited relationship of this kind appears in selected subseries. The results suggest that charge transfer provides the binding energy of the exciplex, while the internal conversion of electronic excitation involves a vibronic mechanism not strongly dependent on the reduction potentials of the quenchers. (Author)

AD-777 042/3GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
MULTIPHOTON TRANSITIONS IN HELIUM BETWEEN 1S AND 2S LEVELS.
Technical rept.,
Hermenzo D. Jones. 27 Feb 74, 20p Rept no. NOLTR-74-4

Descriptors: *Helium, *Electron transitions, Atomic energy levels, Electromagnetic fields, Approximation, Wave functions.
Identifiers: *Multiphoton absorption.

An extension of the momentum-translation approximation to include many-electron systems is presented. The multiphoton 1S-2S transition amplitude for a helium atom in the presence of combined intense and weak electromagnetic fields is calculated. Nonperturbative behavior of the results is exhibited at high intensities. (Author)

AD-777 053/0GA PC$3.00/MF$1.45
Texas Univ Austin Dept of Physics
THEORETICAL STUDY OF THE EFFECTIVE POLARIZABILITY OF ADSORBED MOLECULES ON METAL SURFACES.
Technical rept.,
Peter R. Antoniewicz. 3 Apr 74, 10p Rept no. TR-1
Contract N00014-67-A-0126-0018

Descriptors: *Adsorption, *Dipole moments, Atoms, Metals, Surfaces, Polarization.
Identifiers: Gas surface interactions, Electromagnetic induction.

Atoms adsorbed on a metal surface acquire an induced dipole moment. An argument is presented which leads to a new mechanism responsible for these induced dipole moments. (Author)

AECL-4581 PC$3.25/MF$1.45
Atomic Energy of Canada LTD., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
NONDESTRUCTIVE NEUTRON ACTIVATION ANALYSIS OF SILICON CARBIDE.
T. T. Vandergraaf, and A. G. Wikjord. Oct 73, 23p
U.S. Sales Only.

Descriptors: (*Silicon carbides, *Activation analysis), (*Sodium, Activation analysis), (*Scandium, Activation analysis), (*Titanium, Activation analysis), Antimony, Chromium, Cobalt, Gamma spectroscopy, Hafnium, Impurities, Iron, Lanthanum, Manganese, Neutron reactions, Nondestructive analysis, Powders, Quantitative chemical analysis, Vanadium, Zirconium.

For abstract, see NSA 29 07, number 15205.

ARH-2913 PC$4.00/MF$1.45
Atlantic Richfield Hanford CO., Richland, Wash. (Usa).
DETERMINATION OF TRACE QUANTITIES OF THORIUM IN URANYL NITRATE BY X-RAY EMISSION SPECTROMETRY.
W. I. Winters. Oct 73, 32p
Contract AT(45-1)-2130

Descriptors: (*Thorium, *X-ray spectroscopy), (*Uranium, X-ray spectroscopy), Accuracy, Emission spectroscopy, Precipitation, Quantitative chemical analysis, Sensitivity, Trace amounts, Uranyl nitrates.

For abstract, see NSA 29 07, number 15306.

BNWL-SA-4726 PC$3.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
DETECTION SYSTEMS FOR THE LOW-LEVEL RADIOCHEMICAL ANALYSIS OF IODINE-131, IODINE-129, AND NATURAL IODINE IN ENVIRONMENTAL SAMPLES.
F. P. Brauer, and J. H. Kaye. 26 Oct 73, 26p
CONF-731112-22
Contract AT(45-1)-1830

Descriptors: (*Iodine 131, *Gamma spectroscopy), (*Iodine 129, *Activation analysis), (*Iodine, Activation analysis), Environment, Interfering elements, Neutron reactions, Radiochemical analysis, Sensitivity.

For abstract, see NSA 29 07, number 15206.

BUP-55 PC$3.25/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
INNER SHELL COULOMB IONIZATION BY HEAVY CHARGED PROJECTILES.
J. M. Hansteen. Aug 73, 23p CONF-730672-1
U.S. Sales Only.

Descriptors: (*Oxygen ions, *Ion-atom collisions), (*Hydrogen ions 1 plus, Ion-atom collisions), (*Argon, Ion-atom collisions), (*Copper, Ion-atom collisions), Alpha beams, Atom-atom collisions, Born approximation, Coulomb excitation, Cross sections, Deuteron beams, Differential cross sections, Electronic structure, Fluorine, Heavy ions, Ion beams, Ionization, Proton beams, Reviews, Semiclassical approximation, Silver, Tin.

For abstract, see NSA 29 07, number 16803.

CEA-N-1667 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
ANALYTICAL DETERMINATION OF ALPHA EMITTERS (PU, AM, AND CM) IN FECES.
J. Ballada, L. Jeanmaire, and P. Nauche. Oct 73, 10p
In French. U.S. Sales Only.

Descriptors: (*Plutonium, *Radiochemical analysis), (*Curium, Radiochemical analysis), (*Americium, Radiochemical analysis), (*Feces, Radiochemical analysis), Alpha decay radioisotopes, Alpha spectrometers, Filters, Personnel monitoring, Precipitation, Quantitative chemical analysis, Solvent extraction.

For abstract, see NSA 29 07, number 15307.

CEA-R-4583 PC$5.50/MF$1.4
Cea Centre d'Etudes Nucleaires de Saclay, 91 Gif-sur-Yvette (France).
SYNTHESIS OF RARE EARTH COMPOUN CONTAINING TRIVALENT EUROPIUM A PROMETHIUM-147 IONS AND THE STUDY LUMINESCENCE UNDER BETA EXP - I CITATION.
A. Babusinux. Dec 73, 67p
In French. U.S. Sales Only.

Descriptors: (*Yttrium compou *Fluorescence), (*Vanadates, Fluorescen (*Lanthanum compounds, Fluorescen (*Oxysulfides, Fluorescence), Beta decay, E particles, Doped materials, Emission spec Energy-level transitions, Europium compou Infrared spectra, Lasers, Promethium c pounds, Promethium 147, Synthesis.

For abstract, see NSA 29 07, number 16121.

CNEA-355 PC$3.00/MF$1
Comision Nacional de Energia Atomica, Bue Aires (Argentina).
RADIOACTIVE MINERALS X-RAY DETE MINATION TABLE.
R. O. Toubes, and E. Chaar. 1973, 17p
In Spanish. U.S. Sales Only.

Descriptors: (*Uranium minerals, *X-ray diffra tion), Chemical composition, Tables.

For abstract, see NSA 29 07, number 15308.

COM-74-10549/5GA PC$8.75/MF$1.4
National Bureau of Standards, Washington, D.C Physical Chemistry Div.
THERMODYNAMICS OF CHEMICAL SPECIES IMPORTANT TO ROCKET TECHNOLOGY
Final rept. Jul-Dec 72,
Thomas B. Douglas, and Charles W. Beckett. 1 Jan 73, 111p NBSIR-73-280 AFOSR-TR-74-0062
See also COM-74-10550.

Descriptors: *Thermodynamic properties, *Molybdenum, *Niobium, *Graphite, Molybdenum halides, Enthalpy, Specific heat, Niobium, Vapor pressure, Measurement, Rocket components.
Identifiers: Molybdenum fluorides.

Contents:
Molybdenum:
enthalpy measurements 273-1173 K, and thermodynamic functions 273-2100 K;
Measurement of heat capacity of graphite in the range 1500 to 3000 K by a pulse heating method;

Thermodynamic functions for MoF5(g);
Alternative procedures in interpreting equilibrium data on partially associated vapors;
Change in normal spectral emittance (at 650 nm) of niobium during melting and its relation to surface roughness;
Radiance temperature of niobium at its melting point.

COM-74-10550/3GA PC$9.25/MF$1.45
National Bureau of Standards, Washington, D.C. Physical Chemistry Div.
THERMODYNAMICS OF CHEMICAL SPECIES IMPORTANT TO ROCKET TECHNOLOGY.
Final rept. Jan-Jun 73,
Thomas B. Douglas, and Charles W. Beckett. 1 Jul 73, 123p NBSIR-73-281 AFOSR-TR-74-0063
See also COM-74-10549.

Descriptors: *Thermodynamic properties, *Iron, *Niobium alloys, Tantalum containing alloys, Tungsten containing alloys, Electrical resistivity, Specific heat, Spectral emittance, Phase transformations, Heat of formation, Measurement, Vapor pressure, Rocket components, Molybdenum halides.
Identifiers: Molybdenum flourides, Niobium alloy 10Ta 10W.

Contents:
Simultaneous measurements of specific heat, electrical resistivity and hemispherical total emittance of the ternary alloy niobium (80) - tantalum (10) - tungsten (10) in the range 1500 to 2800 K;
Thermophysical measurements on iron above 1500 K using a transient (subsecond) technique;
A subsecond pulse heating technique for the study of solid-solid phase transformations at high temperatures:
application to iron;
Measurement of melting point, normal spectral emittance (at melting point) and electrical resistivity (near melting point) of some refractory alloys;
The enthalpy of formation of MoF5(c) by solution calorimetry;
The vapor pressure at 393 K of liquid molybdenum pentafluoride, MoF5, according to preliminary static-method measurements.

COM-74-10720/2GA PC$8.75/MF$1.45
Michigan Univ., Ann Arbor. High Altitude Engineering Lab.
FEASIBILITY OF SATELLITE MEASUREMENT OF STRATOSPHERIC MINOR CONSTITUENTS BY SOLAR OCCULTATION.
Technical rept.,
S. R. Drayson, F. L. Bartman, W. R. Kuhn, and R. Tallamraju. Oct 73, 113p UMICH-011023-2-T
NOAA-74030404
Grant NOAA-NG-1072

Descriptors: *Stratosphere, *Spectrosropic analysis, *Atmospheric composition, Absorption spectra, Aerosols, Nitrogen oxide(N20), Carbon monoxide, Trace elements, Ozone, Methane, Water vapor, Optical properties, Computer programs, Infrared spectra, Spaceborn detectors, Transmissivity, Mathematical models, Solar radiation, Refractivity, Gas detectors, Gas analysis, Data reduction, FORTRAN, Transmittance, Chemical composition.
Identifiers: Air pollution detection, FORTRAN 4 programming language, Occultation.

The determination of stratospheric concentration of minor constituents by satellite solar occulation is examined. The method is shown feasible for ozone up to 50 km, water vapor up to 50 km, nitrous oxide up to 30 km, methane up to 50 km and carbon monoxide up to 20 km. Transmittance calculations for these and other gasses are presented for optimal spectral regions. Calculations of extinction by aerosols in the lower stratosphere show a dominant effect in the window regions near 10 micro meters. Several inversion techniques are developed and examples of profiles retrieved by different methods are compared. Computer programs are described to calculate the transmittances by the use of a band model and by the line-by-line integration technique. (Author)

COM-74-10724/4GA PC$8.25/MF$1.45
National Bureau of Standards, Washington, D.C. Physical Chemistry Div.
CHEMICAL KINETICS DATA SURVEY. VII. TABLES OF RATE AND PHOTOCHEMICAL DATA FOR MODELLING OF THE STRATOSPHERE.(REVISED).
Interim rept.,
David Garvin, and R. F. Hampson. Jan 74, 105p
NBSIR-74-430
Supersedes NBSIR-73-203, dated May 73, COM-73-11288.

Descriptors: *Stratosphere, Photochemical reactions, Atmospheric models, Reaction kinetics, Tables(Data), Energy transfer.
Identifiers: *Reaction rates, *Atmospheric chemistry, Ion molecule interactions, High temperature.

Chemical kinetic and photochemical data for gas phase reactions pertinent to the chemistry of the stratosphere are presented in four tables. These tables give recommended values and also cite recent experimental work. They give data in the following subject areas: chemical reactions and photochemistry of neutral species, energy transfer reactions, high temperature air reactions, and ion-molecule reactions. (Author)

COM-74-10736/8GA PC$12.75/MF$1.45
National Bureau of Standards, Washington, D.C. Analytical Chemistry Div.
STATUS OF THERMAL ANALYSIS,
Oscar Menis. Oct 70, 191p NBS-SP-338
Pub. in Proceedings of Symposium on the Current Status of Thermal Analysis, Gaithersburg, Md., 21-22 Apr 70.

Descriptors: *Thermal analysis, *Meetings, Differential thermal analysis, Heat measurement, Standards, Temperature, Calibrating, Explosives, Polymers, Elastomers, Atherosclerosis, Lipids.

This series of papers was presented at a Symposium on the Current Status of Thermal Analysis as part of a joint NBS-ASTM effort to focus attention on the recent trends and needs in the field of thermal analysis. The selected papers cover discussions of the importance of experimental parameters for obtaining information from differential thermal analysis and the evaluation of errors of classical calorimetric measurements. They also include a review of the progress on the development of standards for temperature calibration based on dynamic measurements. Other papers sampled a representative cross section of thermal analysis applications. They encompass areas of high temperature measurements, biochemical, polymer, and explosive materials. In adddition, they provide an evaluation of errors in differential scanning calorimetry and modifications of thermogravimetric apparatus for kinetic studies.

COM-74-10749/1GA PC$5.25/MF$1.45
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
HEAT TRANSFER AND MIXING OF SLUSH HYDROGEN.
Final rept.,
C. F. Sindt, and P. R. Ludtke. Nov 73, 41p NBSIR-73-344
Contract NASA-W-13300

Descriptors: *Heat transfer, *Mixing, Mixers, Temperature gradients, Stratification, Cryogenics, Liquid hydrogen.
Identifiers: *Slush hydrogen.

Heat transfer to slush hydrogen and mixing were investigated in a 1 cubic meter cylindrical vessel. The effects of heat transfer rates on thermal stratification and on self-pressurization were measured. Temperature profiles in thermal stratification were found to be more dependent on slush level and slush settling rates than on liquid level. Solids in the slush appear to be involved in the heat transfer mechanism as slush level affected the amount of warm liquid reaching the top of the dewar and therefore affected the self-pressurization rates. Mixing effectiveness and power requirements to mix slush hydrogen were determined for two configurations of turbine mixers and one paddle mixer. Mixing power requirements were found to be sensitive to the mixer location and configuration. (Author)

COM-74-50207/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
HYDROSTATIC LIMITS IN LIQUIDS AND SOLIDS TO 100 KBAR.
Final rept.,
G. J. Piermarini, S. Block, and J. D. Barnett. 1973, 6p
Pub. in Jnl. of Applied Physics, v44 n12 p5377-5382 Dec 73.

Descriptors: *Liquids, *Solids, *Hydrostatic tests, Hydrostatic pressure, Pressure measurement, Carbinols, Alcohols, Water, Sodium chloride, Silver chloride, Mixtures, Pentanes, Ethanols.

The hydrostatic properties of the materials methanol, isopropyl alcohol, water, sodium chloride, silver chloride, and the binary mixtures pentane-isopentane and methanol-ethanol have been determined in the diamond-anvil pressure cell up to 180 kbar by line-broadening and line-shift measurements of the sharp R1 ruby fluorescence line. A liquid mixture 4:1 by volume of methanol:ethanol remains hydrostatic to almost 100 kbar at room temperature. This mixture exceeds the hydrostatic limit of the previous generally accepted fluid, 1:1 pentane:isopentane which has a hydrostatic limit of about 70 kbar. Silver chloride and water (ice VII) are better than sodium chloride as pressure-transmitting media, but do not even qualitatively approach hydrostatic conditions much above 70 kbar. The stress sensitivity level of the ruby limits the extent to which slight deviations from hydrostatic conditions can be determined in solid systems and suggests the qualitative nature of the method in characterization of quasihydrostatic states. The equilibrium freezing pressure of methanol at 24 was redetermined to be 35.8 plus or minus 0.8 kbar.

COM-74-50271-01/GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
JOURNAL OF RESEARCH OF THE NATIONAL BUREAU OF STANDARDS: A, PHYSICS AND CHEMISTRY. VOLUME 78A, NUMBER 1, JANUARY-FEBRUARY 1974.
Bimonthly rept.
Feb 74, 95p NBS-JRA-78A-1
Paper copy available from GPO $17.00/year as C13.22/SecA:78, $3.00/copy as C13.22/SecA:78/1.

Descriptors: *Scientific research, Diffusion, Refractory metals, Iron, Measurement, Density(Mass/volume), Volume, Melting, Electrical properties, Thermophysical properties, Solubility, Borates, Chemistry, Physics.

Contents:
Thermophysical measurements on iron above 1500K using a transient (subsecond) technique;
Measurement of melting point, normal spectral emittance (at melting point) and electrical resistivity (near melting point) of some refractory alloys;
Comparative density measurements for solid specimens weighing a few milligrams;
A density scale based on solid objects;

Geometrical considerations in the measurement of the volume of an approximate sphere;
Note on diffusion of vapor into flowing gas;
Theoretical analysis of miscibility gaps in the alkali-borates;
Publications of the National Bureau of Standards.

COM-74-50284/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
RAMAN SPECTRUM OF F3NO GAS.
Final rept.,
N. Amindav, H. Selig, and S. Abramowitz. 1974, 2p
Pub. in Jnl. of Chemical Physics, v60 n1 p325-326, 1 Jan 74.

Descriptors: *Raman spectra, Spectrum analysis, Molecular vibration, Thermodynamic properties.
Identifiers: *Nitrogen fluoride oxide (ONF3), Nitrogen fluoride oxides.

The Raman spectrum of gaseous on F3NO has been observed allowing a definite vibrational assignment. The thermal functions have been computed using this assignment and previous microwave and electron diffraction data.

COM-74-50287/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
EFFECTS OF N-ATOM CONCENTRATION, PRESSURE, AND CARRIER COMPOSITION ON SOME FIRST POSITIVE BAND INTENSITIES IN THE YELLOW NITROGEN AFTERGLOW.
Final rept.,
Robert L. Brown. 1970, 14p
Pub. in Jnl. of Chemical Physics, v52 n9 p4604-4617, 1 May 70.

Descriptors: *Nitrogen, *Afterglows, Models, Molecular vibration, Molecular energy levels, Pressure, Atoms, Molecular relaxation.

Absolute intensities of seven N2 1st positive bands with v' = 6 through 12 were measured as a function of carrier pressure, carrier composition, and N-atom concentration in the range 4.5 to 0.06 torr. An attempt was made to fit the results to a model involving vibrational relaxation and electronic quenching in B triplet Pi. While qualitatively successful, this model could not account quantitatively for the observed relative intensity changes over the whole pressure range for which data are available and in addition, implied physically unreasonable vibrational relaxation rates. It is suggested that the observed changes in the virbrational distribution below 4 torr may arise from vibrational relaxation in some precursor state.

COM-74-50293/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
NMR SECOND MOMENT OF ROTATOR-PHASE POLYCRYSTALLINE N-C19H40.
Final rept.,
Ronald E. Dehl. 1974, 2p
Pub. in Jnl. of Chemical Physics, v60 n1 p339-340, 1 Jan 74.

Descriptors: *Alkanes, *Nuclear magnetic moments, Polycrystalline, Nuclear magnetic resonance, Molecular rotation.
Identifiers: *Nonadecanes, NMR second moments.

The proton NMR second moment of polycrystalline n-C19H40 in the rotator phase at 25C was measured for several spectra of the as-received ('98.5%') and the solution recrystallized paraffin. The theoretical NMR second moment of the 'rotator' paraffin was reevaluated, using exact calculations of the most important dipolar contributions and estimates of the smaller terms. The NMR second moment is consistent with simple rotation or large-amplitude oscillation of the chains about their long axes.

COM-74-50299/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PHASE RELATIONS IN THE SYSTEMS NA2O-IRO2 AND NA2O-PTO2 IN AIR.
Final rept.,
C. L. McDaniel. 1974, 8p
Pub. in Jnl. of Solid State Chemistry, v9 p139-146 1974.

Descriptors: *Sodium oxides, *Platinum oxides, Dissociation, X ray diffraction, Stoichiometry.
Identifiers: *Iridium oxides, *Phase studies.

The equilibrium phase relations for the Na2O-IrO2 and Na2O-PtO2 systems were determined in air using the quenching technique. Stoichiometries and dissociation temperatures are reported. Indexed x-ray diffraction powder patterns for Na2O-IrO2 and 2Na2O-IrO2 are given.

COM-74-50300/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
REVISED ANALYSIS OF THE (2P5)3S, 3P, 3D, AND 4S CONFIGURATIONS OF TRIPLY IONIZED ALUMINUM (AL IV).
Final rept.,
Victor Kaufman, Marie-Christine Artru, and Wan-U Lydia Brillet. Feb 74, 5p
Pub. in Jnl. of the Optical Society of America, v64 n2 p197-201 Feb 74.

Descriptors: *Aluminum, *Ultraviolet spectra, Electron transitions, Atomic energy levels, Spectrum analysis.

The spectrum of triply ionized aluminum (Al IV) was observed between 700 and 2200 A. About sixty new lines have been identified as transitions between the (2p5)3s, 3p, 3d and 4s configurations. The ground-state combinations have been remeasured (124 - 161 A). Energies and designations are given for all levels of these configruations, and several changes and additions to the previous analysis have been made. Results of calculations of these configurations are included to support the level identifications. An isoelectronic comparison is discussed.

COM-74-50301/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MEASUREMENTS ON THE NITROGEN ATOM AND PRESSURE DEPENDENCES OF THE VISIBLE NITROGEN AFTERGLOW INTENSITY IN A NITROGEN CARRIER USING EPR.
Final rept.,
W. Brennen, and Robert L. Brown. 1970, 2p
Pub. in Jnl. of Chemical Physics, v52 n9 p4910-4911, 1 May 70.

Descriptors: *Nitrogen, *Afterflows, Energy transfer, Pressure, Atoms, Electron paramagnetic resonance.

The relative visible nitrogen afterglow intensity in a N2 carrier was measured as a function of pressure and N-atom concentration using EPR detection over a range 0.12 to 75 torr. The specific intensity was found to be independent of pressure and N-atom concentration, within the experimental uncertainty.

COM-74-50302/0GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Metallurgy Div.
SOFT X-RAY EMISSION SPECTRA OF METALLIC SOLIDS: CRITICAL REVIEW OF SELECTED SYSTEMS AND ANNOTATED SPECTRAL INDEX.
Final rept.,
A. J. McAlister, R. C. Dobbyn, J. R. Cuthill, and M. L. Williams. Jan 74, 177p NBS-SP-369
See also COM-74-50107.
Paper copy available from GPO $1.85 as C13.10:369.

Descriptors: *X ray spectra, *Emission spectra, *Metals, Sodium, Lithium, Nickel, Indexes(Documentation), Aluminum, Magnesium, Copper, Solids, Theory, Experimental design, Reviews, Alloys, Intermetallics.

Theory and experimental practice in the field of soft x-ray emission from metallic solids are briefly reviewed, and measurements on a number of systems (Al, Al in Au Alx, Al and Mg in Al-Mg, Cu, Cu and Ni in Cu-Ni, Li, Mg, Na and Ni) are critically evaluated and compared with the results of other techniques and theory with a view to establishing and pertinence of the soft x-ray measurements and indicating specific guidelines for further enhancing their value. In addition, an exhaustive annotated index of measured spectra is provided. (Author)

COM-74-50307/9GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo.
TRANSFER OF RADIATION IN SPECTRAL LINES.
Final rept.,
V. V. Ivanov. Nov 73, 476p NBS-SP-385
Library of Congress Catalog no. 73-600273.
Paper copy available from GPO $7.45 as C13.10:385.

Descriptors: *Spectral lines, *Light scattering, Theory, Atmospheric scattering, Gases, Numerical analysis, Gases, Numerical analysis, Atomic energy levels, USSR, Translations, Greens function, Lorentz transformations, Integral equations.
Identifiers: *Radiative transfer.

The book is a revised and somewhat extended version of V. V. Ivanov's Radiative Transfer and the Spectra of Celestial Bodies, published in Moscow in 1969. The principal subject is the transfer of radiant energy through a gas composed of atoms with two discrete levels. Although the emphasis of the book is on analytical methods, extensive numerical and graphical results are presented.

COO-1574-37 PC$3.00/MF$1.45
Michigan State Univ., East Lansing (Usa).
PROPERTIES OF RARE-GAS SOLIDS. PROGRESS REPORT FOR PERIOD ENDING FEBRUARY 28, 1974.
G. L. Pollack. 1974, 17p
Contract AT(11-1)-1574

Descriptors: (*Rare gases, *Research programs), (*Solids, Research programs), Argon, Biological materials, Helium ii, Kapitza resistance, Superfluidity, Thermal conductivity.

For abstract, see NSA 29 07, number 17963.

COO-2092-27 PC$3.00/MF$1.45
Chicago Univ., Ill. (Usa).
DYNAMICS OF CHEMICAL REACTIONS. PROGRESS REPORT, JANUARY 1, 1973--DECEMBER 31, 1973.
Y. T. Lee. 1973, 14p
Contract AT(11-1)-2092

Descriptors: (*Atom-atom collisions, *Research programs), (*Atom-molecule collisions, Research programs), (*Molecule-molecule collisions, Research programs), Chemical reactions.

For abstract, see NSA 29 07, number 16804.

COO-3403-8 PC$3.75/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Chemistry.
ROTATIONAL ORDERING IN THE SOLID MOLECULAR HYDROGENS. PROGRESS REPORT NO. 8, NOVEMBER 1, 1972--OCTOBER 30, 1973.
1973, 33p

Descriptors: (*Deuterium, *Spin-lattice relaxation), Isomers, Mixtures, Order-disorder transformations, Rotation, Solids.

For abstract, see NSA 29 07, number 17964.

FRNC-TH-435 PC$7.75/MF$1.45
Clermont-Ferrand Univ., 63 (France).
REDUCTION OF PENTAVALENT AMERICIUM BY HYDROGEN PEROXIDE IN PERCHLORIC SOLUTION.
N. Damien. 112p
In French. U.S. Sales Only.

Descriptors: (*Americium, *Reduction), Americium compounds, Aqueous solutions, Cations, Chemical reaction kinetics, Hydrogen peroxide, Perchloric acid, Ph value, Quantity ratio.

For abstract, see NSA 29 07, number 15340.

GERHTR-73 PC$3.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
MASS SPECTROMETRIC ANALYSIS OF GAS COMPOSITION DURING THE FORMATION OF PYROLYTIC CARBON FROM METHANE.
H. Luhleich, L. Suetterlin, P. Pflaum, and H. Nickel. 1972, 20p

Descriptors: (*Methane, *Pyrolysis), (*Ethane, *Chemical reaction yield), (*Hydrocarbons, Chemical reaction yield), (*Pyrolytic carbon, *Deposition), Chemical reaction kinetics, Temperature dependence, Time dependence, Very high temperature.

For abstract, see NSA 29 07, number 16367.

IPNO/TH-73-28 PC$3.50/MF$1.45
Rijksuniversiteit Utrecht (Netherlands). Fysisch Lab.; Paris-11 Univ., 91 - Orsay (France). Inst. De Physique Nucleaire.
SYMMETRY BETWEEN COULOMB ATTRACTION AND REPULSION IN RADIATIVE PROCESSES.
P. J. Brussaard, and S. Klarsfeld. Jun 73, 26p
U.S. Sales Only.

Descriptors: (*Atoms, *Analytical solution), (*Plasma, *Coulomb field), Analytic functions, Coulomb excitation, Dirac equation, Electronic structure, Integrals, Matrix elements, Multipoles, Quantum mechanics, Relativistic range, Semiclassical approximation, Symmetry.

For abstract, see NSA 29 07, number 16854.

JPRS-61505 PC$4.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
AUTOMATIC GAS DETECTORS,
N. G. Farzane, and L. V. Ilyasov. 18 Mar 74, 136p
Trans. of mono. Avtomaticheskie Detektory Gazov, Moscow, 1972 168p.

Descriptors: *Gas detectors, Calibration, Dielectric properties, Gas ionization, Heat of combustion, Viscosity, Density(Mass/Volume), USSR, Translations, Optical properties, Acoustic properties, Gas analysis, Automatic control, Chemical analysis.

The report contains discussions of automatic gas detection systems, which are used extensively in the design of automatic gas analyzers. Detailed descriptions are given of automatic gas detectors sensitive to density, viscosity, heat of combustion, and dielectric constant. Detectors based on various effects of ionization of gases and on optical and acoustic phenomena are described. Calibration of automatic detection systems is discussed at length.

KFKI-73-60 PC$3.00/MF$1.45
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
ROTATIONAL DIFFUSION OF PARA-AZOXYANISOLE MOLECULES IN LIQUID CRYSTAL AND ISOTROPIC LIQUID STATE.
L. Bata, and I. Vizi. 1973, 14p
U.S. Sales Only.

Descriptors: (*Liquid crystals, *Rotational states), (*Anisole, Rotational states), (*Azo compounds, Rotational states), Diffusion, Molecules.

For abstract, see NSA 29 07, number 17975.

LA-UR-73-1615 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
DETECTION OF THE STABLE ISOTOPES OF CARBON USING A 3-MV VAN DE GRAAFF AND THE APPLICATION TO ENVIRONMENTAL AND BIOLOGICAL STUDIES.
D. A. Close, J. J. Malanify, and C. J. Umbarger. 1973, 5p CONF-731112-14
Contract W-7405-eng-36

Descriptors: (*Carbon 13, *Nuclear reaction analysis), Biological materials, Carbon 12, Gamma radiation, Nitrogen 13, Nitrogen 14, Proton reactions, Quantitative chemical analysis, Tracer techniques.

For abstract, see NSA 29 07, number 15232.

LA-5464-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
DEGENERACIES OF VIBRATION--ROTATION LEVELS IN CERTAIN OCTAHEDRAL MOLECULES.
C. D. Cantrell. Nov 73, 10p
Contract W-7405-eng-36

Descriptors: (*Molecules, *Rotational states), Fermions, Spin, Vibrational states.

For abstract, see NSA 29 07, number 17966.

LA-5467-PR PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
DEVELOPMENT OF A MULTISTAGE TANDEM AIR SAMPLER FOR MERCURY. LASL PROJECT R-660. QUARTERLY REPORT, APRIL 1--SEPTEMBER 30, 1973.
E. E. Campbell, P. E. Trujillo, and G. O. Wood. Nov 73, 11p
Contract W-7405-eng-36

Descriptors: (*Mercury, *Monitoring), Absorption spectroscopy, Air filters, Air samplers, Desorption, Organometallic compounds.

For abstract, see NSA 29 07, number 17976.

N74-17157/0GA PC$5.50/MF$1.45
Missouri Univ., Kansas City.
STUDY OF AIR POLLUTANT DETECTORS.
Final Technical Report.
P. L. Gutshall, and C. Q. Bowles. Jan 74, 49p
NASA-CR-114719
Contract NAS2-7078

Descriptors: *Air pollution, *Mass spectrometers, Contaminants, Detectors, Ionization, Membranes, Separators.

For abstract, see STAR 1208

N74-17425/1GA PC$4.75/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
NONSTATIONARY HOMOGENEOUS NUCLEATION.
K. G. Harstad. 15 Jan 74, 35p NASA-CR-136830, JPL-TM-33-666
Contract NAS7-100

Descriptors: *Condensing, *Drops (Liquids), *Nucleation, Applications of mathematics, Homogeneity, Nozzle flow, Supersaturation, Thermodynamics, Vapors.

For abstract, see STAR 1208

N74-17426/9GA PC$4.75/MF$1.45
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
PERTURBATION THEORIES FOR POLAR FLUIDS.
L. Verlet. Nov 73, 35p LPTHE-73/29

Descriptors: *Monte carlo method, *Perturbation theory, Pade approximation, Polarization characteristics, Spheres, Two body problem.

For abstract, see STAR 1208

N74-17435/0GA PC$4.00/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
OBSERVATIONS OF SELECTIVE DIFFRACTION IN SODIUM VAPOUR.
Y. Oehman, and L. Lindberg. Nov 73, 10p TRITA-EPP-73-18

Descriptors: *Diffraction patterns, *Sodium vapor, *Wave diffraction, Argon, Electromagnetic absorption, Gratings (Spectra), Lines.

For abstract, see STAR 1208

PAT-APPL-438 152 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
METHOD AND APPARATUS FOR RAPID PARTICLE SIZE AND MASS ANALYSIS.
Patent Application,
Charles B. Daellenbach, and Warren M. Mahan.
Filed 29 Jan 74, 16p DOCKET/MIN-1996
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Particle size distribution, *Hydrocyclones, *Size determination, Attenuation, Size separation, Mass, Gamma rays.

The patent application describes a method and apparatus to practice the method for rapidly determining the size and mass distribution of a sample of randomly sized particles of a known total mass. A series of substantially identical hydrocyclones are connected by conduits to each other. By restricting the cross-sectional areas of these conduits to progressively smaller values, the slurry containing the sample particles is caused to increase its velocity as it moves from hydrocyclone to hydrocyclone. The largest sized particles are suspended in the closed apex of the first hydrocyclone with smaller sized particles, in given size ranges, being suspended in the next succeeding hydrocyclone's apexes. Attenuation of gamma radiation can be related to the mass or weight of the discrete fractions of suspended particles.

PATENT-2 194 054 Not available NTIS
Department of the Interior, Washington, D.C.
APPARATUS FOR CONCENTRATING TRACE IMPURITIES IN HIGH-PURITY HELIUM.
Patent,
William M. Deaton, and Calvin G. Kirkland. Filed 7 Aug 61, patented 13 Jul 65, 6p PAT-APPL-129 909, DOCKET/MIN-440
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Gas analysis, *Helium, *Impurities, Pipes(Tubes), Concentrating, Cold traps, Mass spectroscopy, Trace elements, Purity.
Identifiers: PAT-CL-73-25.

The invention relates to improvements in an analyzing apparatus and method for testing samples of highly purified helium gas by concentrating trace impurities contained in this helium to a degree that will permit analysis of the impurities by a mass spectrometer or other conventional means of analysis. Impurities are concentrated by freezing them out from the sample, in a trap cooled by liquid helium.

PATENT-3 228 750 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR SEPARATING RARE-EARTH ELEMENTS BY ION EXCHANGE.
Patent,
Roald E. Lindstrom, and J. Oscar Winget. Filed 7 Jun 62, patented 11 Jan 66, 10p PAT-APPL-200 894, DOCKET/MIN-526
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rare earth elements, *Patents, *Ion exchanging, *Separation, Chelation, Ion exchange resins, EDTA, Chelating agents.
Identifiers: PAT-CL-23-22.

This invention is concerned with a method for the fractionation of rare earth mixtures and the recovery of rare earth metals. A solution of the ions to be separated is contacted with an ion exchange resin. Separation of the different ions is made possible by differences in distribution of the various ions between the solid and liquid phases (values of equilibrium constants differ for different ions). These differences are enhanced by selectively complexing the ions in solution and repeating the ion exchange reaction many times.

PATENT-3 259 472 Not available NTIS
Department of the Interior, Washington, D.C.
FRACTION SEPARATION OF AQUEOUS RARE EARTHS USING AMINES.
Patent,
Andrew C. Rice. Filed 30 Oct 61, patented 5 Jul 66, 11p PAT-APPL-148 775, DOCKET/MIN-409
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rare earth elements, *Patents, *Solvent extraction, *Chelating agents, pH, Primary amines, Acyclic amines, Organic solvents, Inorganic sulfates.
Identifiers: PAT-CL-23-312.

This invention relates to a method for fractionating and separating rare earth values from aqueous solutions, and more particularly to a method employing higher amines to this end. The process comprises extracting an aqueous solution containing rare earth elements with a solution of a higher amine in a water insoluble, relatively inert, organic liquid diluent at a pH ranging from about neutral to highly acid to form extract and raffinate phases, and then recovering the rare earths from the extract and raffinate phases by stripping or precipitation.

PB-230 727/0GA PC$5.75/MF$1.45
California Univ., Berkeley.
STUDIES OF OXYGEN REDUCTION AT A ROTATING DISK ELECTRODE.
Research and development progress rept.,
Melvin Forbes, and Scott Lynn. Mar 74, 201p* Int-OSW-RDPR-74-935
Grant DI-14-01-0001-1461

Descriptors: *Oxygen, *Reduction(Chemistry), *Water analysis, Gas analysis, Activation, Electrochemistry, Surface chemistry, Reaction kinetics, Experimental design, Polarization(Charge separation), Dissolved gases, Calibration, Accuracy.
Identifiers: *Platinum electrodes, *Rotating disc electrodes, Chemical reaction mechanisms, Winkler test.

The kinetics and mechanism of oxygen reduction at platinum were investigated by means of rotating disc electrode for potential applicability to measurement of dissolved oxygen. A kinetic expression for the current for oxygen reduction was developed, taking into account both direct 4-electron reduction, electrochemical reduction, possible catalytic decomposition of hydrogen peroxide, and loss of H2O2 by diffusion. The mechanism of activation and deactivation of a platinum surface with respect to oxygen reduction was investigated. It was found that, under the experimental conditions of this study, the surface was deactivated by a mixed process of poisoning and desorption of a catalytic layer which had been formed during anodic activation. A miniature version of the Winkler oxygen analysis was developed for use in this study. (Modified author abstract)

RISO-271 PC$3.75/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
SIMULTANEOUS DETERMINATION OF ARSENIC, MANGANESE, AND SELENIUM IN HUMAN SERUM BY NEUTRON ACTIVATION ANALYSIS.
E. Damsgaard, K. Heydorn, N. A. Larsen, and B. Nielsen. Jun 73, 35p CONF-710623-3
U.S. Sales Only.

Descriptors: (*Arsenic, *Activation analysis), (*Manganese, Activation analysis), (*Selenium, Activation analysis), (*Blood serum, Activation analysis), Accuracy, Contamination, Errors, Interfering elements, Irradiation capsules, Losses, Man, Manganese 54, Multi-element analysis, Neutron reactions, Quantitative chemical analysis, Sample preparation, Solvent extraction, Thermal neutrons.

For abstract, see NSA 29 07, number 15234.

TT-73-53048 PC$15.50/MF$1.45
National Bureau of Standards, Washington, D.C.
THERMOPHYSICAL PROPERTIES OF WATER IN THE CRITICAL REGION: A HANDBOOK,
S. L. Rivkin. 1973, 642p
Trans. of mono. Teplofizicheskie Svoistva vody v Kriticheskoi Oblasti, Moscow, 1970 635p, by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Thermodynamic properties, *Water, *Handbooks, Translations, USSR.

The present reference book presents data on thermodynamic properties (specific volume, enthalpy and isobaric heat capacity), carry factors (of viscosity and heat conductivity), and Prandtl number of water in critical region. The tables encompass a range of pressures from 200 to 400 bars and of temperatures from 350 to 500C; the tables are composed at the steps of one bar and one degree. Quoted in the book are the equations used in the estimation of table values.

UCRL-7873(Pt.4) PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SOME ANALYTICAL METHODS FOR EXPLOSIVES AND EXPLOSIVE SIMULANTS, PART IV.
W. Selig. 8 Oct 73, 57p
Contract W-7405-eng-48

Descriptors: (*Chemical explosives, *Chemical analysis), Gas chromatography, Nitrocellulose, Petn, Quantitative chemical analysis, Solvent extraction, Titration, Tnt.

For abstract, see NSA 29 07, number 17977.

7E. Radio and Radiation Chemistry

AD-776 450/9GA Reprint
National Bureau of Standards Washington D C Inst for Materials Research
PHOTOIONIZATION OF CARBON DIOXIDE,
K. E. McCulloh. 13 Jun 73, 12p AROD-10831.1-C
Availability: Pub. in the Jnl. of Chemical Physics, v59 n8 p4250-4259, 15 Oct 73.

Descriptors: *Photoionization, *Carbon dioxide, Ions, Molecular energy levels, Spectrum analysis, Dissociation, Planetary atmospheres, Mars(Planet).
Identifiers: Chemical reaction mechanisms, *Mars atmosphere.

The yields of photoions from CO2 cooled to 150K have been measured at a resolution of 0.22A for CO2(+) and 0.4A for the O(+) and CO(+) fragements, in the photon energy region extending from onset for each species to approximately 20 eV. Most of the observed structure of the molecular ion yield curve recapitulates the well known features of the absorption spectrum, but a number of anomalies are reported and discussed. (Modified author abstract)

AD-776 504/3GA Reprint
Louisiana State Univ New Orleans Dept of Chemistry
THE PHOTOLYSIS OF TETRAPHENYLETHYLENE EPISULFIDE,
R. C. Petterson, A. L. Hebert, G. W. Griffin, I. Sarkar, and O. P. Strausz. 23 Apr 73, 5p AROD-10005.3-C
Grant DA-ARO-D-31-124-73-G4
Prepared in cooperation with Loyola Univ., New Orleans, La. Dept. of Chemistry and Alberta Univ., Edmonton. Dept. of Chemistry.
Availability: Pub. in Jnl. of Heterocyclic Chemistry, v10 p879-881 Oct 73.

Descriptors: *Sulfur heterocyclic compounds, *Photolysis, Chemical structure, Elimination reactions, Reaction kinetics.
Identifiers: Chemical reaction mechanisms, Ethane/epithio-tetraphenyl, Ethylene sulfide.

Tetraphenyl substitution in thiirane does not alter the photolytic behavior of thiirane; the decomposition is characterized by sulfur elimination in the absence of any detectable products arising from carbon-carbon bond cleavage. (Author)

AD-776 585/2GA Reprint
California Inst of Tech Pasadena Gates and Crellin Labs of Chemistry
MECHANISMS OF PHOTOCHEMICAL REACTIONS IN SOLUTION. LXXVI. COMPLEX DECAY MECHANISMS IN BI- AND TRICHROMOPHORIC SYSTEMS,
D. DeKeukeleire, E. C. Sanford, and George S. Hammond. 23 Mar 73, 5p Rept no. Contrib-4645
AFOSR-TR-74-0382
Grant AF-AFOSR-1958-71
See also report dated 14 Apr 72, AD-761 901.
Availability: Pub. in Jnl. of the American Chemical Society, v95 p7904-7906 1973.

Descriptors: *Photochemical reactions, *Esters, Excitation, Molecular isomerism, Chemical structure.
Identifiers: Chemical reaction mechanisms, Pentenoic acid/4-methyl-4-phenyl-2, *Chromophoric compounds, *Rearrangement reactions.

Esters of 4-methyl-4-phenylpent-2-enoic acid (C6H5(CH3)CCCH=CHCO2R) have been prepared and irradiated. All the compounds undergo photochemical cis = trans isomerization. In the bichromophoric system in which R = C2H5 the trans isomer also rearranges by 1,3-phenyl migration with formation of a cyclopropane derivative and the cis isomer rearranges to another cyclopropane by a path involving abstraction of a hydrogen atom from one of the methyl groups in the delta-position with respect to the carbonyl function. (Modified author abstract)

AD-776 661/1GA PC$3.00/MF$1.45
Washington State Univ Pullman Dept of Chemistry
PICOSECOND FLASH PHOTOLYSIS AND SPECTROSCOPY: 3,3'-DIETHYLOXADICARBOCYANINE IODIDE (DODCI).
Technical rept. 1 Apr 73-28 Feb 74,

Douglas Magde, and Maurice W. Windsor. Mar 74, 16p Rept no. TR-3 ONR-TR-3
Contract N00014-68-A-0410-0003

Descriptors: *Visible spectra, *Cyanine, Dyes, Absorption spectra, Electron transitions, Quantum efficiency, Molecular energy levels, Relaxation time, Fluorescence.
Identifiers: *Flash photolysis, Cyanine dyes.

The authors demonstrate transient absorption spectroscopy with picosecond time resolution and nanometer spectral resolution over the entire visible region. To resolve multiple discrepancies in the literature, they studied 3,3'-diethyloxadicarbocyanine iodide, measuring both excited singlet lifetime and ground state depletion and recovery. The kinetics of the two processes are the same. They report fluorescence yield determinations and comment on the controversy over photoisomer generation. (Modified author abstract)

AD-776 702/3GA Reprint
North Carolina Univ Chapel Hill Dept of Chemistry
PHOTOCHEMISTRY OF ALKENES. DIRECT IRRADIATION IN HYDROXYLIC MEDIA,
Paul J. Kropp, Edward J. Reardon, Jr., Zalman L. F. Gaibel, Kenny F. Williard, and James H. Hattaway, Jr. 14 Jun 73, 13p AROD-10268.2-C
Grant DA-ARO-D-31-124-72-G50
Sponsored in part by Grant PHS-PR-330.
Availability: Pub. in Jnl. of the American Chemical Society, v95 n21 p7058-7067, 17 Oct 73.

Descriptors: *Alkenes, *Cycloalkenes, *Photochemical reactions, Molecular isomerism, Photolysis, Nuclear magnetic resonance, Infrared spectra.

The photochemical behavior of a series of alkenes and cycloalkenes on direct irradiation in hydroxylic media has been studied and compared with the sensitized behavior of these same olefins under similar conditions. Photoprotonation, photofragmentation, and some novel reactions are discussed.

AD-776 727/0GA Reprint
University of Southern California Los Angeles
PHOTOKINETIC STUDIES ON BENZOPHENONE. PHOTOCYCLOADDITION TO KETENIMINES AND SELF-QUENCHING OF THE BENZOPHENONE TRIPLET,
Lawrence A. Singer, Ronald E. Brown, and Gene A. Davis. 25 May 73, 8p AROD-10445.5-C
Grant DA-ARO-D-31-124-72-G137
Availability: Pub. in Jnl. of the American Chemical Society, v95 p8638-8643 1973.

Descriptors: *Benzophenones, *Photochemical reactions, *Addition reactions, *Phosphorescence, Quantum efficiency, Molecular energy levels, Quenching(Inhibition).
Identifiers: *Ketenimines.

The kinetics of the photocycloaddition of benzophenone to three ketenimines (1, dimethyl-N-(cyclohexyl)-; 2, dimethyl-N-(phenyl)-; 3, diphenyl-N-(cyclohexyl)ketenimine) in benzene at room temperature were investigated by adduct quantum yield measurements in the absence and presence of di-tert-butyl nitroxide (DTBN), and by direct benzophenone phosphorescence lifetime measurements. Results are interpreted in terms of a scheme which takes into account the reversible formation of a diffusion encounter pair between the benzophenone triplet and ketenimine. (Modified author abstract)

AD-776 741/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF THE FORMATION MECHANISM OF RADICAL IO BY THE IMPULSE PHOTOLYSIS METHOD,
D. Yu. Stupin, and V. N. Tezikov. 8 Mar 74, 10p Rept no. FTD-HT-23-858-74
Edited trans. of Khimiya Vysokikh Energii (USSR) v7 n3 pp227-229 May/Jun 73, by Rene E. Courville.

Descriptors: *Photolysis, *Free radicals, Absorption spectra, Excitation, Oxides, Iodine compounds, Atoms, Translations, USSR.
Identifiers: *Iodine oxides, Chemical reaction mechanisms.

It has been established by the impulse photolysis method with spectroscopic recording for systems C3F7I + O2 and C3F7I + N2O that the basic process for the formation of radical IO occurs with the participation of excited atoms of I(doublet P(1/2)).

AD-776 827/8GA Reprint
California Inst of Tech Pasadena Gates and Crellin Labs of Chemistry
EXCITED STATE FORMATION IN THE IRRADIATION OF 1, 3-CYCLOHEXADIENE,
Thomas L. Penner, and George S. Hammond. 1971, 13p Rept no. Contrib-4094 AFOSR-TR-74-0395
Contract AF-49(638)-1479
Availability: Pub. in Organic Scintillators and Liquid Scintillation Counting, p327-337 1971.

Descriptors: *Radiation chemistry, Irradiation, Excitation, Dimers, Cyclohexenes, Molecular energy levels, Gamma rays, Reaction kinetics, Energy transfer.
Identifiers: *Cyclohexadiene compounds, *Dimerization, Chemical reaction mechanisms.

Irradiation of 1,3-cyclohexadiene with high energy radiation leads to dimerization. Relative amounts of these dimers vary widely with reaction conditions but the composition of the mixtures can be expressed in terms of variable amounts of two groups each of which contains the dimers in a fixed proportion. The evidence indicates that one of these groups arises from dimerization of the cyclohexadiene cation and that the other originates from diene triplets. The latter in turn appear to be produced by neutralization of ions. Singlet product, 1, 3, 5-hexatriene, is also formed but is not ionic in origin. The effect of a change in linear energy transfer on the radiation processes is also investigated. (Author)

AD-777 021/7GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
EFFECTS OF A MAGNETIC FIELD ON SOME PHOTOSENSITIZED REACTIONS,
A. Gupta, and G. S. Hammond. 14 Apr 72, 5p Rept no. Contrib-4443 AFOSR-TR-74-0390
Grant AF-AFOSR-1958-71
Availability: Pub. in Jnl. of Chemical Physics, v57 n4 p1789-1790, 15 Aug 72.

Descriptors: *Penta dienes, *Photochemical reactions, Magnetic fields, Reaction kinetics, Photosensitivity, Molecular isomerism, Molecular energy levels, Ketones, Energy transfer, Quantum efficiency.
Identifiers: *Stilbenes, Rearrangement reactions.

An external magnetic field was found to affect rates of triplet-triplet energy transfer processes. Both the initial quantum yields and the composition of photostationary states were found to be field dependent in triplet energy transfer from aromatic ketonic sensitizers to isomeric stilbenes and piperylenes. The magnitude of the effect varied from 5 to 20%, and was dependent on the structures of sensitizers and acceptors. (Modified author abstract)

COM-74-50310/3GA MF$1.45
National Standard Reference Data System.
RADIATION CHEMISTRY OF ETHANOL: A REVIEW OF DATA ON YIELDS, REACTION RATE PARAMETERS, AND SPECTRAL PROPERTIES OF TRANSIENTS,
Gordon R. Freeman. Feb 74, 42p NSRDS-NBS-48
Prepared by Alberta Univ., Edmonton. Dept. of Chemistry. Library of Congress Catalog no. 73-600192.
Paper copy available from GPO $0.80 as stock number 0303-01166, C13.48:48.

Descriptors: *Ethanols, *Radiation chemistry, Free radicals, Absorption spectra, Radiolysis, Solid phases, Liquid phases, Vapor phases, Electron poromagnetic resonance, Tables(Data).
Identifiers: Reaction rates.

The yields (G) for products and intermediates formed by irradiation of ethanol, in the solid, liquid and gaseous state, have been compiled and reviewed. Rates of reactions of transient ions and radicals and spectroscopic parameters, including optical and esr spectra, are also included. (Author)

COO-2026-14 PC$3.00/MF$1.45
Minnesota Univ., Minneapolis (Usa). Dept. Of Chemical Engineering and Materials Science.
STUDIES IN CHEMICAL REACTIVITY. PROGRESS REPORT, JANUARY 1, 1973--DECEMBER 31, 1973.
R. W. Jr. Carr. 1973, 11p
Contract AT(11-1)-2026

Descriptors: (*Hydroxyl radicals, Chemical reaction kinetics), (*Chemical reaction kinetics, *Research programs), Acetylene, Butenes, Ethylene, Photolysis, Pressure dependence, Propylene.

For abstract, see NSA 29 07, number 15367.

COO-2190-10 PC$3.00/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Chemistry.
CHARACTERIZATION OF THE COLLISIONAL DISTRIBUTION FUNCTION IN RECOIL SYSTEMS.
L. D. Spicer, and C. J. Malerich. 14p CONF-730961-2
Contract AT(11-1)-2190

Descriptors: (*Tritium, *Hot atom chemistry), Collisions, Deuterium, Distribution functions, Excitation functions, Hydrogen, Recoils.

For abstract, see NSA 29 07, number 15403.

COO-3373-11 PC$3.25/MF$1.45
New England Inst., Inc., Ridgefield, Conn. (Usa).
BROMINE AND OXYGEN QUENCHING OF POSITRONIUM IN SILICA GEL.
S. Y. Chuang, and S. J. Tao. 1974, 22p CONF-730850-1
Contract AT(11-1)-3373

Descriptors: (*Bromine, *Positronium), (*Oxygen, Positronium), (*Silica gel, Positronium), Angular correlation, Annihilation, Emission, Lifetime, Photons, Positrons.

For abstract, see NSA 29 07, number 16796.

COO-3373-12 PC$3.25/MF$1.45
New England Inst., Inc., Ridgefield, Conn. (Usa).
POSITRONIUM IN MOLECULAR SUBSTANCES.
S. J. Tao. 1973, 25p CONF-730850-2
Contract AT(11-1)-3373

Descriptors: (*Positronium, *Reviews), Amorphous state, Annihilation, Crystals, Diffusion, Functionals, Group theory, Liquids, Molecules, Solids, Surface tension, Van der waals forces.

For abstract, see NSA 29 07, number 16797.

FRNC-R-32 PC$3.75/MF$1.45
Centre National de la Recherche Scientifique, 67 - Strasbourg (France). Centre de Recherches Nucleaires.

CHEMICAL EFFECTS OF NUCLEAR TRANSFORMATIONS. 1972 BIBLIOGRAPHY.
J. P. Adloff. 1972, 34p
In French and English. U.S. Sales Only.

Descriptors: (*Hot atom chemistry, *Bibliographies), Chemical radiation effects, Nuclear reactions, Recoils.

For abstract, see NSA 29 07, number 15404.

FRNC-TH-403 PC$6.75/MF$1.45
Strasbourg-1 Univ., 67 (France).
STUDY OF THE FORMATION OF IODIDES IN SOLID PENTANE AND BENZENE IRRADIATED WITH I EXP + AND I SUB 2+ IONS.
H. Akcay. 1973, 94p
In French. U.S. Sales Only.

Descriptors: (*Pentane, *Chemical radiation effects), (*Benzene, Chemical radiation effects), (*Organic iodine compounds, *Hot atom chemistry), Aromatics, Ev range, Iodine ions, Ion beams, Irradiation, Kev range 01-10, Low temperature, Radicals, Solids.

For abstract, see NSA 29 07, number 15368.

PB-230 987/0GA PC$4.50/MF$1.45
Calspan Corp., Buffalo, N.Y.
DETERMINATION OF THE FORMATION MECHANISMS AND COMPOSITION OF PHOTOCHEMICAL AEROSOLS.
Annual summary rept. (Final),
W. C. Kocmond, D. B. Kittelson, J. Y. Yang, and K. L. Demerjian. 31 Aug 73, 115p CALSPAN-NA-5365-M-1 CRC-APRAC-CAPA-8-71-2
Contract EPA-68-02-0557

Descriptors: *Photochemical reactions, *Aerosols, *Test chambers, Nitrogen dioxide, Sulfur dioxide, Laboratory equipment, Test chambers, Experimental design, Smog, Air pollution, Nitrogen oxides, Coagulation, Reaction kinetics, Air, Propylene, Walls, Humidity.
Identifiers: Atmospheric chemistry.

During the first program year, emphasis was placed on examining aerosol behavior in the relatively simple SO2-clean air system using chambers of widely different surfact-to-volume ratios. A limited number of experiments were also performed using the propylene-NOx system. Substantial effort was directed toward upgrading and testing the Calspan chamber and its support facilities. Numerous tests were performed to evaluate wall effects and establish overall chamber background reactivity. Tests were designed to study the formation mechanisms of aerosols in the SO2-clean air system and to a lesser extent in the NOx-propylene system. The effects of relative humidity on aerosol formation as well as the influence of bag size on particle growth and decay were also studied.

UCD-34-P-158-X-2 PC$3.00/MF$1.45
California Univ., Davis (Usa). Dept. Of Chemistry.
HIGH ENERGY ATOMIC CHEMISTRY AND CHEMICAL RADIATION EFFECTS. PROGRESS REPORT, JANUARY 1, 1973--DECEMBER 31, 1973.
1973, 20p

Descriptors: (*Hot atom chemistry, *Research programs), (*Fluorine 18, Hot atom chemistry), Recoils.

For abstract, see NSA 29 07, number 15405.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

COM-74-50189-02-01/GA
(Order as COM-74-50189-02)
Scripps Institution of Oceanography, La Jolla, Calif.
NOTES ON THE ECOLOGY OF THE OCEANIC INSECT HALOBATES,
Lanna Cheng. 1974, 8p NOAA-74030603-1, MFR-Paper-1032
Included in Marine Fisheries Review, v36 n2 p1-7 Feb 74, COM-74-50189-02.

Descriptors: *Marine biology, *Insects, *Animal ecology, Feeding habits, Ocean environments.
Identifiers: *Halobates, Heteroptera, Predation.

Members of the genus Halobates (Heteropters: Gerridae) are the only known insects found in the oceans yet they are among the least studied marine organisms. There are 39 known species. These live exclusively on the surface of the ocean, as they are wingless and cannot fly. Information is given on their feeding habits and general biology.

8B. Cartography

AD-900 456/5GA PC$9.00/MF$1.45
Bendix Research Labs., Southfield, Mich.
PHOTOGRAMMETRIC IMAGE DISSECTOR SCANNER STUDY.
Final rept. Dec 70-Dec 71,
Daniel C. Kowalski, R. J. Huckins, C. C. Matle, and D. W. Windrich. May 72, 119p RLD-6054 RADC-TR-71-312
Contract F30602-71-C-0005
Distribution Limitation now Removed.

Descriptors: (*Stereoscopic map plotters, Optical scanning), Photogrammetry, Photographic images, Automation, Signal-to-noise ratio, Photomultipliers, Lasers, Image tubes, Operation, Performance(Engineering).
Identifiers: *Image dissector tubes, AS-11B-1 automated stereoplotters, Contrast enhancement, Optical contrast, Spatial filters, Vidissector, Image dissectors, Flying spot scanners, Modulation transfer function, MTF(Modulation Transfer Function).

A study and investigation were conducted to determine the feasibility of applying the image dissector tube to image scanning in stereophotogrammetric instruments such as the AS-11B-1 automated analytical stereoplotter. The main objectives of this work were to compare the performance of the image dissector scanner with the present flying-spot scanner in the AS-11B-1 system and to determine the advantages and feasibility of applying coherent optical contrast enhancement to improve the image dissector performance. The study and investigation involved work with a breadboard image dissector scanner system. The results of the study and investigation showed that an image dissector scanner system can be designed to meet the AS-11B-1 system specifications and out perform the flying-spot scanner in areas of high average image density. (Modified author abstract)

COM-74-50229/5GA PC-GPO/MF$1.45-NTIS
National Ocean Survey, Rockville, Md. Photogrammetric Research Branch.
COMPLETE COMPARATOR CALIBRATION.
Technical rept.,
Laurence W. Fritz. Jul 73, 102p NOAA-TR-NOS-57 NOAA-74021905
Paper copy available from GPO $1.30 as C55.13:NOS 57.

Descriptors: *Photogrammetry, *Comparators, Calibrating, Computer programs, FORTRAN.
Identifiers: CDC 6600 computers, CALIB computer program.

The complete measurement and data reduction procedures used to peform routine comparator calibrations for quality control of all comparator measurements are presented. The techniques and mathematical models developed are applicable to all measuring comparators including those with rectangular formats. The mathematical model used for the isolation of linear systematic errors consists of a new exact solution of the general linear transformation problem, from which the calibration parameters are exactly derived functions. Polynomials are applied to define the systematic nonlinear errors inherent in the comparator. The adjustment residuals are presented in the coordinate systems of both the measurements and the grid in order to isolate grid errors from random errors. Rigorous statistical analyses of all system components and results are included. These statistics isolate the errors of the pointings, the grid, the comparator, and the residual system noise (random errors). The accompanying versatile FORTRAN-coded computer program provides numerous computational options and several graphic outputs to permit easy diagnostic evaluation of the complete measurement system. (Author)

E74-10349 PC$4.50/MF$1.45
Inter-American Geodetic Survey, Fort Clayton, Canal Zone. Natural Resources Div.
CARTOGRAPHIC EXPERIMENT FOR LATIN AMERICA.
Progress rept. 1 Aug 73-28 Feb 74,
Jack E. Staples. 28 Feb 74, 30p NASA-CR-136957
Contract NASA Order T-4651-B
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Avenue, Sioux Falls, S. D. 57198.

Descriptors: Mapping, Multispectral photography, Bolivia, Paraguay, EREP, Skylab program, Photointerpretation, Photogrammetry.

The author has identified the following significant results. The two experiments clearly demonstrate the practical application of the Skylab photography to update existing maps at an optimum scale of 1:100,000. The photography can even be used, by employing first order photogrammetric instruments, for updating the cultural features in 1:50,000 scale mapping. The S190A imagery has also shown itself to be most economical in preparing new photomap products over previously unmapped areas, such as Concepcion, Paraguay. These maps indicate that Skylab quality imagery is invaluable to the Latin American cartographers in their efforts to provide the mapping products required to develop their countries. In Latin America, where over 5,000 people are employed in map production and where the Latin American governments are expending over $20 million in this effort, the use of such systems to maintain existing mapping and publish new mapping over previously unmapped areas, is of great economic value and could release the conventional Latin American mapping resources to be utilized to produce large scale 1:25,000 and 1:1,000 scale mapping that is needed for specific development projects.

E74-10355 PC$4.00/MF$1.45
Geological Survey, Reston, Va. Geographic Applications Program.
URBAN AND REGIONAL LAND USE ANALYSIS: CARETS AND CENSUS CITIES EXPERIMENT PACKAGE.
Monthly progress rept.,
Robert H. Alexander. 20 Dec 73, 7p NASA-CR-137040
Contract NAS Order T-5290-B

Descriptors: Land use, Cities, Climatology, Multispectral band scanners, Central Atlantic Region(US), EREP, Skylab program, Ecology, Multispectral photography, Mapping.

The author has identified the following significant results. The arrival of the so-called energy crisis makes the portion of this experiment dealing with land use climatology of more immediate significance than before, since in addition to helping to understand the processes of climatic change associated with urbanization, the knowledge obtained may be useful in assigning an energy balance impact factor to proposed changes in land use in and around cities. Thermal maps derived from S-192 data are to be used as a measure of the energy being radiated into space from the mosaic of different surfaces in and around the city. While presenting excellent spatial sampling potential for a metropolitan area test site, the Skylab data permit a very poor temporal sampling opportunity, owing to the large number of factors beyond the investigator's control that determine when data will be taken over a given test site. The strategy is to augment the thermal maps derived from S-192 with a modeling technique which enables the simulation of a number of components of the surface energy balance, calculated at regular time intervals through out the day or year. Preliminary tests on the performance of the model are still underway, using airborne MSS data from NASA aircraft flights. Results look extremely promising.

E74-10374 PC$4.25/MF$1.45
Bendix Corp., Ann Arbor, Mich. Aerospace Systems Div.
ERTS-1: AUTOMATED LAND-USE MAPPING IN LAKE WATERSHEDS.
Special rept.,
Phillip E. Chase, Robert H. Rogers, Larry E. Reed, and V. Elliot Smith. Mar 74, 24p NASA-CR-137071
Contract NAS5-21810
Prepared in cooperation with Cranbrook Inst. of Science.

Descriptors: Land use, Lakes, Mapping, Watersheds, Michigan, Earth resources program, Water quality, Eutrophication, Water resources, Water pollution.

The author has identified the following significant results. ERTS-1 computer compatible tapes were used as a basis to generate land use maps in lake watersheds in southeastern Michigan. These maps, generated on a repetitive basis, provide information essential to governmental agencies concerned with planning and control of lake eutrophication. The ERTS mapping products included geometrically current land use map overlays at 1:250,000 and 1:48,000 scale and area measurement printouts. The printouts provide, within the watershed boundaries and by land use category, a quantitative measure of the amount of land, in square kilometers and acres. This quantitative measure of land use in watersheds is essential to the development and application of deterministic models, which compute nutrient flows into lakes and establish lake eutrophication rates.

E74-10377 PC$7.50/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Service de la Carte de la Vegetation.
MANAGEMENT OF NATURAL RESOURCES THROUGH AUTOMATIC CARTOGRAPHIC INVENTORY.
Progress rept. no. 2, Feb-Dec 73,
Paul-Augustin Rey, Yves Gourinard, Francis Cambou, J. C. Guyader, and P. Gouaux. Dec 73, 87p NASA-CR-137162
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198.

Descriptors: Resources management, Structural properties(Geology), Photomapping, Forests, France, Spain, Earth resources program, Agriculture, Botany, Photointerpretation, Data processing, Inventories.

The author has identified the following significant results. Significant results of the ARNICA program (February - December 1973) were: (1) The quantitative processing of ERTS-1 data was developed along two lines: the study of geological structures and lineaments of Spanish Catalonia, and the phytogeographical study of the forest region of the Landes of Gascony (France). In both cases it is shown that the ERTS-1 imagery can be used in establishing zonings of equal quantitative interpretation value. (2) In keeping with the operational transfer program proposed in previous reports between exploration of the imagery and charting of the object, a precise data processing method was developed, concerning more particularly the selection of digital equidensity samples computer display and rigorous referencing.

E74-10378 PC$5.00/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Service de la Carte de la Vegetation.
MANAGEMENT OF NATURAL RESOURCES THROUGH AUTOMATIC CARTOGRAPHIC INVENTORY.
Progress rept. no. 3, Apr-Dec 73,
Paul-Augustin Rey, Yves Gourinard, and Francis Cambou. Jan 74, 37p NASA-CR-137163

Descriptors: Resources management, Photomapping, France, Multispectral photography, Management planning, Earth resources program, Water resources, Agriculture, Forests, Land use, Structural properties(Geology), Meteorology, Marine environments.

The author has identified the following significant results. (1) Accurate recognition of previously known ground features from ERTS-1 imagery has been confirmed and a probable detection range for the major signatures can be given. (2) Unidentified elements, however, must be decoded by means of the equal densitometric value zone method. (3) Determination of these zonings involves an analogical treatment of images using the color equidensity methods (pseudo-color), color composite and especially temporal color composite (repetitive superposition). (4) After this analogical preparation, the digital equidensities can be processed by computer in the four MSS bands, according to a series of transfer operations from imagery and automatic cartography.

E74-10382 PC$4.00/MF$1.45
Geological Survey, Reston, Va. Geographic Applications Program.
LAND USE MAPPING AND MODELLING FOR THE PHOENIX QUADRANGLE.
Progress rept. 1 Jul-31 Dec 73,
John L. Place. 1 Jan 74, 5p NASA-CR-137167
Contract NASA Order S-70243-AG

Descriptors: Land use, Photomapping, Phoenix Quadrangel(AZ), Multispectral photography, Earth resources program, Image enhancement, Photointerpretation, Crop identification, Rangelands, Reservoirs, Mines(Excavations).

The author has identified the following significant results. Changes in the land use in the Phoenix (1:250,000 scale) Quadrangle in Arizona have been mapped using only the images from ERTS-1, tending to verify the utility of a land use classification system proposed for use with ERTS images. Seasonal changes were studied on successive ERTS-1 images, particularly large scale color composite transparencies for August, October, February, and May, and this seasonal variation aided delineation of land use boundaries. Types of equipment used to aid interpretation included color additive viewer, a twenty-power magnificer, a denity slicer, and a diazo copy machine. A Zoom Transfer Scope was used for scale and photogrammetric adjustments. Types of changes detected have been: (1) cropland or rangeland developed as new residential areas; (2) rangeland converted a new cropland or to new reservoirs; and (3) possibly new activity by the mining industries. A map of land use previously compiled from air photos was updated in this manner. ERTS-1 images complemented air photos: the photos gave detail on a one-shot basis; the ERTS-1 images provided currency and revealed seasonal variation in vegetation which aided interpretation of land use.

PATENT-2 869 419 Not available NTIS
Department of the Interior, Washington, D.C.
ORTHOPHOTOSCOPE.
Patent,
Russell K. Bean. Filed 28 Aug 56, patented 20 Jan 59, 13p PAT-APPL-606 788, DOCKET/SUR-228
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Photogrammetry, *Map projection, *Patents, Stereomapping.
Identifiers: PAT-CL-88-24, Orthophotomaps.

The invention relates to apparatus for producing by photographic means substantially exact photomaps which are orthogonal projections of the ground on a horizontal plane.

PATENT-3 276 311 Not available NTIS
Department of the Interior, Washington, D.C.
OPTICAL PLUMBING DEVICE FOR ESTABLISHING FROM AN AERIAL LOCATION THE POSITION OF A MARK ON THE GROUND.
Patent,
James L. Buckmaster, and Hugh B. Loving. Filed 4 Dec 62, patented 4 Oct 66, 9p PAT-APPL-242 334, DOCKET/SUR-570
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Surveying instruments, *Optical equipment, *Vertical indicators, *Patents, Aerial surveys.
Identifiers: PAT-CL-88-22.

The invention relates to an optical plumbing device having particular utility as an aid in establishing from an aerial location, the position of a mark or target on the ground corresponding to a control point in a long range survey operation. A helicopter which may be used in the survey operation, is maneuvered to hover directly over the ground target whereby this craft is enabled to function as a survey station. It then serves as a target for distant sighting instruments, and as a platform on which are located instruments to measure the distance from the helicopter to the ground mark, and to at least two remote ground control stations whose geodetic positions are known.

8C. Dynamic Oceanography

AD-776 517/5GA Not available NTIS
Nato Subcommittee on Oceanographic Research Copenhagen (Denmark)
MESURES HYDROLOGIQUES EN MEDITERRANEE ORIENTALE (SEPTEMBRE 1968) (HYDROLIC MEASUREMENTS IN THE EASTERN MEDITERRANEAN (SEPTEMBER 1968)).
Technical rept.,
E. Accerboni, and G. Rancini. Mar 72, 23p Rept no. TR-61
Text in French; summaries in Italian and English. Prepared in cooperation with Osservatorio Geofisico Sperimentale, Trieste (Italy). Rept. no. Contrib-220.
Availability: Pub. in Bolletting di Geofisica Teorica ed Applicata, v14 n53/54 p3-24 Mar-Jun 72.

Descriptors: *Mediterranean Sea, *Ocean currents, Salinity, NATO.
Identifiers: Aegean Sea.

NATO Subcommitee on Oceanographic Research has planned during September 1968 an hydrological survey in the Eastern Mediterranean in order to get information about the surface exchange with the Aegean Sea throughout the Eastern Straits and about the thermohaline structure of the atlantic

and levantine waters along Crete - Libya section and in the Rhodes area. Results obtained by classical measurements, Sippicans and horizontal profiles of temperature and current (G.E.K.), indicate that a noticeable surface outflow of cold waters was occurring from the Aegean Sea, with a mean velocity of 40 cm/sec. The atlantic water, recognizable by a lower salinity value, was observed to flow along the Libyan coasts, being this an anomalous situation. The water core was defined by a minimum of salinity of 37.80%, instead of the normal value of 38.45%, found by other authors. The effect of this lowering of salinity, probably due to physical processes occurring in the central Mediterranean basin, is felt in the Rhodes region, too. (Author)

AD-776 593/6GA PC$3.75/MF$1.45
Louisiana State Univ Baton Rouge Coastal Studies Inst
RHYTHMIC PATTERNS OF BEACH TOPOGRAPHY.
Technical rept.,
Johannes L. van Beek. Mar 74, 54p Rept no. TR-157
Contract N00014-69-A-0211-0003

Descriptors: *Beaches, *Geomorphology, Ocean waves, Florida, Sediment transport, Topography.

Rhythmic patterns of topography may be apparent simultaneously in a longshore alternation of cuspate projections and arcuate embayments along the beach face, in a rhythmic longshore bar composed of an alternate series of arcs and cusps, and in longshore undulation of the nearshore bed. Development and modification of rhythmic topography were monitored for 3 weeks along the Gulf Coast at Seagrove Beach, Florida. The indication is that, independent of scale, rhythmically spaced cuspate projections along the beach face can be either modified arcuate deposits or cuspate forms resulting from the formation of arcuate embayments by erosion. (Modified author abstract)

AD-776 643/9GA PC$5.75/MF$1.45
Tetra Tech Inc Pasadena Calif
NEARSHORE CIRCULATIONS UNDER SEA BREEZE CONDITIONS AND WAVE-CURRENT INTERACTIONS IN THE SURF ZONE.
Technical rept.,
Edward K. Noda, Choule J. Sonu, Viviane C. Rupert, and J. Ian Collins. Feb 74, 216p Rept nos. TT-TC-149-4, TETRAT-P-72-149-4

Descriptors: *Air water interactions, *Surf, *Sea breeze, Ocean waves, Ocean currents, Shores, Mathematical models, Vortices, Mass transfer, Shallow water, Motions, Reviews, Computer programs.
Identifiers: Surf zone, Rip currents.

Numerical models for nearshore circulation patterns in the surf zone were developed and applied to an observed condition subjected to a sea breeze environment. Bottom topography and input waves were derived from observed data to predict surf zone circulation as a function of time of day. It was found that many features observed in the surf zone were modeled but wave-current interactions are known to be important. Wave-current interactions were modeled for shallow water assuming a two-dimensional motion which included rip current and lonshore current components. The refraction effects caused by even small currents produce major changes in the wave induced driving forces in the surf zone which leads to the prediction of entirely different rip-current patterns when wave-current interactions are considered. Numerical results are presented and a discussion of the numerical techniques is included. A review of water wave theories to include mass transport, vorticity and current was made for a vertical section in shallow water of constant depth. (Author)

AD-776 706/4GA Reprint
Louisiana State Univ Baton Rouge Coastal Studies Inst
A DYNAMIC ROUGHNESS EQUATION AND ITS APPLICATION TO WIND STRESS DETERMINATION AT THE AIR-SEA INTERFACE.
Technical rept.,
S. A. Hsu. 28 Aug 73, 9p Rept no. TR-159
Contract N00014-69-A-0211-0003
Availability: Pub. in Jnl. of Physical Oceanography, v4 n1 p116-120 Jan 74.

Descriptors: *Air water interactions, Wind, Surface roughness, Stresses.

A dynamic roughness equation including major wind and wave interaction parameters (wind shear velocity, wave height, and phase velocity) is derived. Because this equation implicitly incorporates the effects of wave steepness, relative water depth, and wind duration and fetch, it may be applied to a wide variety of natural conditions. This equation was used to construct a nomogram which can be utilized to determine the wind stress at the sea surface, given phase velocities, wave heights, and the wind verified by the available field and laboratory data under near-neutral atmospheric stability conditions from which the appropriate parameters could be determined. (Author)

AD-776 873/2GA Reprint
Woods Hole Oceanographic Institution Mass
STRATIFIED EKMAN BOUNDARY LAYER MODELS.
Technical rept.,
Rory Obata Refi Yossarian Thompson. 2 Oct 72, 13p Rept nos. WHOI-74-10, WHOI-Contrib-2943
Contract N00014-66-C-0241
Availability: Pub. in Geophysical Fluid Dynamics, v5 p201-210 1973.

Descriptors: *Fluid dynamics, *Boundary layer flow, Turbulence, Ocean models, Stratification.
Identifiers: Ekman layers.

'Ekman' layers are proposed for use in geophysical fluid dynamic models which involve no arbitrary 'eddy viscosity.' These layers are single slabs which conserve buoyancy and momentum rather than energy, and use a slab Richardson (or Froude) number criterion for closure. (Modified author abstract)

AD-776 875/7GA Reprint
Woods Hole Oceanographic Institution Mass
ON THE GENERATION OF INTERNAL GRAVITY WAVES BY A FLUCTUATING BUOYANCY FLUX AT THE SEA SURFACE.
Technical rept.,
L. Magaard. 15 Nov 72, 14p Rept nos. WHOI-74-20, WHOI-Contrib-2905
Contract N00014-66-C-0241
Revision of report dated 30 May 72.
Availability: Pub. in Geophysical Fluid Dynamics, v5 p101-111 1973.

Descriptors: *Ocean surface, *Buoyancy, *Internal waves, *Gravity waves, Air water interactions, Computations.
Identifiers: Internal gravity waves.

The influence of a fluctuating buoyancy flux at the surface of a linearly stratified sea is studied by means of boundary layer theory. It is shown that these fluctuations cause fluctuating horizontal motions in the top boundary layer. The horizontal divergence of these motions generates vertical motion (Ekman suction) which causes internal gravity waves in the interior of the sea. The amplitudes of these waves are computed in terms of density fluctuations at the sea surface. In case of resonance the growth rate of the amplitude of the resonant wave is obtained. The geophysical significance of this generating mechanism is discussed by comparison with the generation of internal waves by a fluctuating wind field. It seems that the effect of a fluctuating buoyancy flux must not be neglected though it cannot compete with the effect of strong winds. (Author)

COM-74-10586/7GA PC$3.25/MF$1.45
Rosenstiel School of Marine and Atmospheric Science, Miami, Fla.
WAVE REFRACTION IN AN EDDY.
Scientific rept.,
Claes G. Rooth, and William J. Teague. Jul 73, 27p
UM-RSMAS-73049 NOAA-74021309
Grant NOAA-043-022-23

Descriptors: *Ocean waves, *Refraction, *Ocean currents, Eddies, Sea states.
Identifiers: Surface gravity waves.

The refraction of surface gravity waves in an eddy is examined through the use of a geometrical optics approximation. It is found that the most significant sea-state enhancement associated with an oceanic eddy may occur well outside the region of significant circulation. Realistic eddy structures lead to a double caustic formation behind the eddy, with the caustic region more intensive on the left in the case of a cyclonic eddy. The eddy is seen to behave like an imperfect lens with a focal length approximately proportional to the group speed of the refracted waves. (Author)

8D. Geochemistry

AD-776 854/2GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
POSTDEPOSITIONAL MOBILITY OF SOME TRANSITION ELEMENTS, PHOSPHORUS, URANIUM AND THORIUM IN DEEP SEA SEDIMENTS,
Enrico Bonatti, D. E. Fisher, Oiva Joensuu, and H. S. Rydell. 22 Sep 70, 14p Rept no. Contrib-1294
Contracts Nonr-4008(02), AT(40-1)-3622
Revision of report dated 17 Jul 70. Support in part by Grants NSF-GA-1602, NSF-GA-1702.
Availability: Pub. in Geochimica et Cosmochimica Acta, v35 p189-201 1971.

Descriptors: *Ocean bottom, *Sediments, *Geochemistry, Pacific Ocean, Trace elements, Oxidation reduction reactions, Manganese, Iron, Nickel, Cobalt, Copper, Chromium, Phosphorus, Lanthanum, Vanadium, Uranium, Thorium.
Identifiers: Diagenesis.

Deep sea hemipelagic sediments from the east Pacific show an oxidized upper zone of variable thickness and a reduced zone below. The geochemistry of a core from this region was studied in detail. The Eh of the upper zone is close to +100 mV, while in the lower zone it reaches about -400 mV. Reducing conditions in the lower section of the core are related to the oxidation of organic matter in the sediment, as indicated by the gradual decrease with depth of the concentration of nitrogen in the upper part of the core. Various elements, such as Mn, Ni, Co, P and La, are enriched in the upper oxidized zone, while Cr, V, U and S are enriched in the lower reduced zone. Postdepositional mobility of the elements in question, mainly by diffusion in the interstitial solutions, can explain their distribution in the core. (Modified author abstract)

AD-776 855/9GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
MANGANESE FLUCTUATIONS IN CARIBBEAN SEDIMENT CORES DUE TO POSTDEPOSITIONAL REMOBILIZATION,
Enrico Bonatti. 1971, 10p Rept no. Contrib-1358
Contracts N00014-67-A-0201-0013, Nonr-4008(02)
Also supported in part by Grant NFS-GA-1602.
Availability: Pub. in Bulletin of Marine Science, v21 n2 p510-518 Jun 71.

Descriptors: *Caribbean Sea, *Sediments, *Geochemistry, Manganese, Cores, Concentration(Chemistry), Layers, Nitrogen, Iron, Nickel, Cobalt.
Identifiers: Diagenesis.

Fluctuations in the concentration of manganese in sediment cores from the Caribbean could be caused by diagenetic remobilization of manganese due to alternations below the sediment-water interface of oxidized and reduced layers. The occurrence of oxidized and reduced layers is ascribed ultimately to Pleistocene climatic fluctuations. Data on the distribution of N, Mn, Fe, Ni, and Co in a Caribbean core are presented in support of this hypothesis. (Author)

8E. Geodesy

AD-776 385/7GA PC$4.75/MF$1.45
Illinois Univ Urbana Dept of Civil Engineering
SAPGOA - A COMPUTER PROGRAM FOR THE SIMULTANEOUS ADJUSTMENT OF PHOTOGRAMMETRIC AND GEODETIC OBSERVATIONS.
Civil engineering studies,
K. W. Wong. Jan 74, 145p Rept nos. UILU-ENG-74-2003, Photogrammetry Ser-38 AROD-8140.5-EN
Grant DA-ARO(D)-31-124-G1129

Descriptors: *Photogrammetry, *Geodesy, *Triangulation, *Computer programs, Least squares method, Standard deviation, Error analysis.
Identifiers: SAPGOA computer program, RMS computer program.

The primary function of the program SAPGOA is to perform analytical aerotriangulation by the method of simultaneous weighted least-squares adjustment. It has the unique capability of using geodetic measurements as controls in the aerotriangulation solution. The program can accept as input the following types of observations: (1) photogrammetric observations: rectangular photo coordinates corrected for lens and film distortions, exterior orientation parameters of each photo, aircraft altitude above ground at each exposure, and ground controls in a rectangular ground coordinate system; and (2) geodetic observations: straight-line distances, geodetic azimuths, Laplace azimuths, horizontal angles, elevation differences, latitudes, longitudes and elevations. The geodetic measurements do not have to form an integrated geodetic network. (Author)

AD-776 567/0GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
GEODETIC INSTRUMENT EXHIBIT,
L. S. Khrenov. 7 Dec 73, 10p Rept no. FSTC-HT-23-1832-72
Trans. of Geodeziya i Kartografiya (USSR) n11 p74-80 1971, by Eileen Weppner.

Descriptors: *Geodesy, *Geophysics, *Instrumentation, Theodolites, Range finding, Gravimetry, Surveying(Geographic), Goniometers, Gyro compasses, Barometers, Translations, USSR.
Identifiers: Expositions, Tacheometers, Gravimeters.

The 'Geodesy-Geophysics-71' exhibition, part of the XV General Assembly of the IUGG in Moscow, featured geodetic instruments and devices from the USSR, the German Democratic Republic, the Federal Republic of Germany, Sweden, Switzerland, France and England. They included theodolites, tacheometers, levels of various accuracies, range finder attachments, light- and radio-range finders, an electronic level, a photoelectric attachment, a microbarograph, gravimeters, and other surveying instruments, some of new design. (Author)

AD-776 750/2GA PC$3.75/MF$1.45
Royal Aircraft Establishment Farnborough (England)
ANALYSIS OF 27 SATELLITE ORBITS TO DETERMINE ODD ZONAL HARMONICS IN THE GEOPOTENTIAL.
Technical rept.,
D. G. King-Hele, and G. E. Cook. Dec 73, 52p Rept no. RAE-TR-73153 DRIC-BR-38388

Descriptors: *Geopotential, *Harmonics, Scientific satellites, Orbits, Harmonic analysis, Great Britain.
Identifiers: Cosmos 44 satellite, Cosmos 248 satellite, GEOS 2 satellite, Explorer 32 satellite, Peole satellite, DIAL satellite, Explorer 42 satellite, Prospero satellite.

The odd zonal harmonics in the geopotential are the terms independent of longitude and antisymmetric about the equator: they define the 'pear-shape' effect. The coefficients J3, J5, J7, ... of these harmonics have been evaluated by analyzing the variations in eccentricity of 27 orbits covering a wide range of inclinations.

COM-74-50231/1GA PC-GPO/MF$1.45-NTIS
National Ocean Survey, Rockville, Md. Geodetic Research and Development Lab.
GRAVITY GRADIENTS AT SATELLITE ALTITUDES.
Technical rept.,
B. Chovitz, J. Lucas, and F. Morrison. Nov 73, 29p NOAA-TR-NOS-59 NOAA-74021903
Contract NASA-L-67767
Paper copy available from GPO $0.55 as C55.13:NOS 59.

Descriptors: *Gravimetric geodesy, Gravity anomalies, Spherical harmonics, Orbits, Artificial satellites.
Identifiers: *Satellite altimetry.

The availability of detailed worldwide gravity anomaly information in the form of 1 degree square blocks makes possible the computation of gravity gradients at close (under 300 km) altitudes, thus indicating the sensitivity required of a satellite-borne gradiometer. As a first step, the gravity anomaly data are transformed to spherical harmonics up to degree and order 75. Satellite orbits are generated by numerical integration, the time step being set to a sampling rate of the gradiometer, and gravity gradients can be computed at this interval. A coordinate system is chosen to correspond to the axis of rotation of the instrument. Results of simple averaging indicate that to distinguish the combined harmonics of a single degree in the range of 60 or 70, a sensitivity of better than 0.01 Eotvos unit is required, and to pick up the total band of harmonics between degrees 60 and 70, a sensitivity of 0.02 Eotvos unit is needed. (Modified author abstract)

COM-74-50264/2GA PC-GPO/MF$1.45-NTIS
Environmental Science Services Administration, Rockville, Md.
MATHEMATICAL GEODESY,
Martin Hotine. 1969, 417p ESSA-Monograph-2 NOAA-74013101
See also AD-648 805. Library of Congress Catalog Card no. 73-602618.
Paper copy available from GPO $5.50.

Descriptors: *Geodesy, *Applications of mathematics, Tensor analysis, Vector analysis, Conformal mapping, Spherical harmonics, Books.

Mathematical Geodesy, an advanced textbook, is arranged in three parts. Part 1 provides the tensor calculus with details on: vectors, tensors, covariant differentiation, intrinsic properties of curves, intrinsic curvature of space, extrinsic properties of surfaces, extrinsic properties of surface curves, areas and volumes, conformal transformation of space and spherical representation. Part 2 deals with coordinate systems of special interest in geodesy. Part 3 deals with the main geodetic applications of the mathematics in Parts 1 and 2. Reference is also made to dynamic satellite geodesy. To facilitate reference, summaries of main formulas are collected as a Summary of Formulas at the end of the book.

COM-74-50274/1GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
CARIBBEAN ATLANTIC GEOTRAVERSE, NOAA-IDOE 1971, REPORT NO. 3, GRAVITY.
Technical rept.,
Leroy M. Dorman, B. G. Bassinger, E. Bernard, S. A. Bush, and O. E. Dewald. Aug 73, 39p NOAA-TR-ERL-277, AOML-11 NOAA-74030401
Grant NSF-AG-253
Paper copy available from GPO as C55.13:ERL 277-AOML 11.

Descriptors: *Gravity, *Caribbean Sea, *North Atlantic Ocean, Gravity anomalies, Maps, Tables(Data).
Identifiers: Free air anomalies.

The report describes the collection and reduction of about 30,000 km of gravity data that were acquired during 1971 by the NOAA ship Researcher as part of the NOAA-IDOE program. Data are presented as a free-air anomaly map and as profiles of free-air anomaly, accompanied by a track chart. The data, in processed and original form, are available through the NOAA National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo., under NGSDC file number 00102. (Author)

E74-10361 PC$4.75/MF$1.45
Battelle Columbus Labs., Ohio.
CALIBRATION AND EVALUATION OF SKYLAB ALTIMETRY FOR GEODETIC DETERMINATION OF THE GEOID.
Progress rept. no. 12, 1-28 Feb 74,
A. G. Mourad, and D. M. J. Fubara. 15 Mar 74, 34p NASA-CR-137046
Contract NAS9-13276

Descriptors: Geodesy, Geoids, Altimeters, Calibrating, EREP, Skylab program, Rangefinding, Height, Satellite-Borne instruments, Time series, Analysis.

The author has identified the following significant results. The analysis was based on a time series intrinsic relationship between the satellite ephemeris, altimeter measured ranges, and the corresponding a priori values of subsatellite geoidal heights. Using, least squares processing with parameter weighting, the objective was to recover: (1) the absolute geoidal heights of the subsatellite points; and (2) the associated altimeter calibration constants. Preliminary results from Skylab mission SL-2 are given, using various combinations from two sets of orbit ephemeris and altimeter ranges. It is shown that correctly scaled geoidal heights cannot be deduced by merely subtracting the altimeter range from the geodetic height of the satellite unless the satellite ephemeris and the altimeter have no unknown significant systematic errors or biases and drifts. It is emphasized that the primary objective of the Skylab altimeter is to determine the instrument feasibility. Any additional applications of the data such as for geodesy, geophysics, and oceanography are desirable. Although accurate orbit is required for such applications, it is not a prerequisite for determining the instrument feasibility.

N74-17108/3GA PC$4.50/MF$1.45
Ohio State Univ. Research Foundation, Columbus. Dept. of Geodetic Science.
THE COMPUTATION OF 15 DEG AND 10 DEG EQUAL AREA BLOCK TERRESTRIAL FREE AIR GRAVITY ANOMALIES.
D. P. Hajela. Feb 73, 27p NASA-CR-132929, REPT-194
Contracts NGR-36-008-161, OSURF PROJ. 3210

Descriptors: *Gravitational fields, *Gravity anomalies, Geodesy, Geomagnetism, Tables (Data).

For abstract, see STAR 1208

N74-17118/2GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RECOMMENDED REFERENCE FIGURES FOR GEOPHYSICS AND GEODESY.
M. A. Khan, and J. A. Okeefe. Oct 73, 23p NASA-TM-X-70585, X-592-73-318
Subm-Submitted for Publication.

Descriptors: *Geodesy, *Geoids, *Geophysics, *Geopotential, *Reference systems, Antarctic regions, Arctic regions, Gravity anomalies, Standards.

For abstract, see STAR 1208

8F. Geography

E74-10376 PC$4.00/MF$1.45
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
AN INTERDISCIPLINARY ANALYSIS OF MULTISPECTRAL SATELLITE DATA FOR SELECTED COVER TYPES IN THE COLORADO MOUNTAINS, USING AUTOMATIC DATA PROCESSING TECHNIQUES.
Monthly progress rept.,
Roger M. Hoffer. Feb 74, 5p NASA-CR-137073
Contract NAS9-13380

Descriptors: Vegetation, Mountains, Colorado, Data processing, Structural properties(Geology), Mineral exploration, EREP, Skylab program, Mines(Excavations), Photomapping.

The author has identified the following significant results. One capability which has been recognized by many geologists working with space photography is the ability to see linear features and alinements which were previously not apparent. To the exploration geologist, major lineaments seen on satellite images are of particular interest. A portion of ERTS-1 frame 1407-17193 (3 Sept. 1973) was used for mapping lineaments and producing an isolineament intersection map. SKYLAB photography over the area of prime area was not useable due to snow cover. Once the lineaments were mapped, a grid with 2.5 km spacing was overlayed on the map and the lineament intersections occurring within each grid square were counted and the number plotted in the center of the grid square. These numbers were then contoured producing a contour map of equal lineament intersection. It is believed that the areas of high intersection concentration would be the most favorable area for ore mineralization if favorable host rocks are also present. These highly fractured areas would act as conduits for carrying the ore forming solutions to the site of deposition in a favorable host rock. Two of the six areas of high intersection concentration are over areas of present or past mining camps and small claims are known to exist near the others. These would be prime target areas for future mineral exploration.

E74-10393 PC$4.00/MF$1.45
Michigan State Univ., East Lansing.
USE OF ERTS DATA FOR A MULTIDISCIPLINARY ANALYSIS OF MICHIGAN RESOURCES.
Progress rept. no. 3,
Axel L. Andersen, Wayne Myers, Gene Safir, and E. P. Whiteside. 21 Mar 74, 20p NASA-CR-137211
Contract NAS5-21834
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Forests, Agriculture, Soil science, Landforms, Michigan, Earth resources program, Multispectral photography, Photomapping, Vegetation, Image enhancement.

The author has identified the following significant results. The results of this investigation of ratioing simulated ERTS spectral bands and several non-ERTS bands (all collected by an airborne multispectral scanner) indicate that significant terrain information is available from band-ratio images. Ratio images, which are based on the relative spectral changes which occur from one band to another, are useful for enhancing differences and aiding the image interpreter in identifying and mapping the distribution of such terrain elements as seedling crops, all bare soil, organic soil, mineral soil, forest and woodlots, and marsh areas. In addition, the ratio technique may be useful for computer processing to obtain recognition images of large areas at lower costs than with statistical decision rules. The results of this study of ratio processing of aircraft MSS data will be useful for future processing and evaluation of ERTS-1 data for soil and landform studies. Additionally, the results of ratioing spectral bands other than those currently collected by ERTS-1 suggests that some other bands (particularly a thermal band) would be useful in future satellites.

E74-10398 PC$4.00/MF$1.45
Geological Survey, Denver, Colo.
A STUDY OF MORPHOLOGY, PROVENANCE, AND MOVEMENT OF DESERT SAND SEAS IN AFRICA, ASIA, AND AUSTRALIA.
Progress rept. 1 Nov-31 Dec 73,
Edwin D. McKee, and Carol S. Breed. 1 Jan 73, 12p NASA-CR-137123
Contract NASA Order S-70243-AG

Descriptors: Deserts, Sands, Africa, Australia, Asia, Morphology, Earth resources program, Mosaics, Pattern recognition, Wind(Meteorology).

The author has identified the following significant results. Recent acquisition of generally high quality color prints for most of the test sites has enabled the project to make significant advances in preparing mosaics of sand desert areas under study. Computer enhancement of imagery of selected sites, where details of complex dune forms need to be determined, has been achieved with arrival of computer-compatible ERTS-1 tapes. Further, a comparator, recently received, gives precise visual measurements of width, length, and spacing of sand bodies and so improves comparison of patterns in various test sites. Considerable additional meteorological data recently received on sand-moving winds in China, Pakistan, Libya and other areas enabled much progress to be made in developing overlays for the dune mosaics. These data show direction, speed, and frequency of winds. Other new data for use in preparing overlays used with ERTS-1 image mosaics include ground truth on moisture control, geologic settings, and plant distribution. With the addition of visual observation data and prints from hand-held photography now being obtained by the Skylab mission, much progress in interpreting the patterns of sand seas for 17 desert sites is anticipated.

8G. Geology and Mineralogy

AD-776 444/2GA Reprint
Naval Oceanographic Office Washington D C
VOLCANO SPACING, FRACTURES, AND THICKNESS OF THE LITHOSPHERE,
P. R. Vogt. 17 Dec 73, 20p
Revision of report dated 9 Oct 73.
Availability: Pub. in Earth and Planetary Science Letters, v21 p235-252 1974.

Descriptors: *Volcanoes, *Tectonics, *Lithosphere, Faults(Geology), Volcano islands, Earth crust, Thickness.

Both 'hot-spot' type and possibly island-arc volcanoes may form at the intersections of fractures whose spacing is near the thickness of the lithosphere and increases with increasing thickness. An approximate equality between layer thickness and spacing of major fractures observed in some sedimentary rocks and clay cake models may thus extend to the 'mega-joints' that have fractured the lithosphere and controlled volcano spacing on the earth, and possibly on Mars. If the hot-spot fractures are interpreted as due to shear, many hot-spot fracture systems suggest roughly north-south least principal stress, or, alternatively in some instances, a 90 degree rotation of this pattern. (Author)

AD-776 446/7GA Reprint
Naval Oceanographic Office Washington D C
DETAILED MAGNETIC SURVEYS IN THE NORTHEAST ATLANTIC AND LABRADOR SEA,
P. R. Vogt, and O. E. Avery. 28 Aug 73, 30p
Revision of report dated 21 Jul 72.
Availability: Pub. in Jnl. of Geophysical Research, v79 n2 p363-389, 10 Jan 74.

Descriptors: *Magnetic anomalies, *North Atlantic Ocean, *Structural geology, Oceanographic data.
Identifiers: *Ocean bottom spreading, Plate tectonics.

In recent years, extensive close-spaced magnetic surveying by vessels of the U.S. Naval Oceanographic Office has augmented an already large data base to provide new insights into the details of sea floor spreading in the North Atlantic. The authors present results of preliminary analyses of the residual magnetic field disclosed by a survey between Reykjanes ridge and Rockall trough and a smaller survey near the junction of the Labrador Sea and the Atlantic Ocean.

AD-776 455/8GA Reprint
Rhode Island Univ Kingston Graduate School of Oceanography
DROWNED AND BURIED VALLEYS ON THE SOUTHERN NEW ENGLAND CONTINENTAL SHELF,
Robert L. McMaster, and Asaf Ashraf. 7 Aug 73, 24p Rept no. Ref-73-14
Contract N00014-68-A-0215-0003
Availability: Pub. in Marine Geology, v15 p249-268 1973.

Descriptors: *Continental shelves, *North Atlantic Ocean, *Drainage, Structural geology, Seismic reflection.
Identifiers: New England, Watersheds.

To compile information concerning relationships of Pleistocene and pre-Pleistocene valleys systems of southern New England's continental shelf, 40 seismic reflection profiles were made off eastern Connecticut, Long Island, New York, Rhode Island, and southeastern Massachusetts from the inner limits of Block Island and Rhode Island Sounds to the shelf edge. The specific objectives of the investigation were: to identify and trace additional shelf drainage networks; to compare the drowned and buried systems in terms of position and origin; and to ascertain the role of these valley networks in the evolution of the continental shelf.

AD-776 565/4GA PC$3.00/MF$.145
Army Foreign Science and Technology Center Charlottesville Va
THERMOELECTRIC PROPERTIES OF ARSENOPYRITES FROM CERTAIN TIN-ORE DEPOSITS OF THE KOMSOMOLSK REGION,
P. G. Korostelev, and V. G. Sazonov. 3 Jan 74, 3p
Rept no. FSTC-HT-23-2355-72
Trans. of Vorposy Geologii, Geokhimii i Metallogenii Severozapadnogo Sektora Tikhookeanskogo Poyasa (Materialy Nauchnoi Sessii, Posvyashcheanoi 10-Letiyu Dalnevostochnogo Geologicheskogo Instituta) (sic), Vladivostok, 1970 (Akademiya Nauk SSSR Sibirskoe Otdelenie), p239-240.

Descriptors: *Pyrites, *Thermoelectricity, USSR, Translations, Electrical conductivity, Crystallization.
Identifiers: Arsenopyrite.

A study of thermoelectrical properties of arsenopyrites from tin-sulfide deposits has shown their thermoelectrical properties and the nature of their conductivity change from the early stages of

the ore-formation process to the later stage. Arsenopyrite associated with cassiterite has hole conductivity, while later arsenopyrite has electron conductivity. For arsenopyrites, unlike galenites, Gorbatov's technique for estimating average values does not work, and instead maximum and minimum values of thermoelectromotive force must be compared. (Author)

AD-776 588/6GA PC$4.00/MF$1.45
Utah Univ Salt Lake City Dept of Mechanical Engineering
ROCK FRACTURE UNDER STRESS GRADIENTS.
Final rept. Dec 72-Dec 73,
Stephen R. Swanson, and Wayne S. Brown. Apr 73, 89p Rept no. UTEC-ME-73-082
Grant H0220008

Descriptors: *Rock mechanics, *Fracture(Mechanics), Test methods, Loads(Forces), Rates, Stresses, Granite, Sandstone.

Rates of loading were varied for Westerly granite and Nugget sandstone notched tension and beam bending specimens, giving loading times from 100 microseconds to 150 seconds. The nominal fracture strength increased with increasing loading rate for all specimen configurations studied, and no consistent trends in the rate effect with specimen stress concentration could be observed. Compression tests of Westerly granite and Nugget sandstone plates with circular and elliptical holes showed an insensitivity of fracture stress to stress concentration in compression, as has been shown previously in tension. Fracture occurred in compression in plate specimens where tension failure had been expected. These last mentioned results are not well understood. (Author)

AD-776 685/8GA PC$7.25/MF$1.45
Woods Hole Oceanographic Institution Mass
THE HISTORY OF SEDIMENTATION AND ABYSSAL CIRCULATION ON THE GREATER ANTILLES OUTER RIDGE.
Technical rept.,
Brian E. Tucholke. Jan 74, 318p Rept no. WHOI-74-1
Contract N00014-66-C-0241, Grant NSF-GA-24872

Descriptors: *Ocean ridges, *North Atlantic Ocean, *Sedimentation, Theses, Ocean currents, Marine geology, Geologic age determination.
Identifiers: *Greater Antilles Outer Ridge, Western Boundary Undercurrent, Antarctic Bottom Water.

The study arose during an investigation of the sediments of the Greater Antilles Outer Ridge, which in initial research were determined to be abyssal brown lutites of dominantly terrigenous derivation interbedded with occasional calcareous lutites. The origin of this accumulation of sediment and the geologic evolution of the Greater Antilles Outer Ridge was chosen as the topic of this research effort.

AD-776 651/2GA PC$5.50/MF$1.45
Blood Research Inst Boston Mass Red Cell Metabolism Lab
COMPUTED DIPOLE RESISTIVITY EFFECTS FOR AN EARTH MODEL WITH VERTICAL AND LATERAL CONTRASTS IN RESISTIVITY,
Robert B. Furgerson, and George V. Keller. 12 Mar 74, 196p
Contract N00014-71-A-0430-0003

Descriptors: *Geophysical prospecting, *Electrical resistivity, *Earth models, Earth crust, Earth mantle.
Identifiers: Resistivity exploration.

The dipole sounding method has been used by several investigators in attempts to determine the maximum resistivity in the earth's crust. The results of such surveys have shown that apparent values of measured resistivity pass through a maximum at dipole spacings of several tens to a hundred kilometers. In interpretation, this behavior is interpreted as indicating the leakage of current through the resistant part of the crust into more conductive regions in the mantle. Computer model studies of the effects of lateral changes in resistivity, as directed in this report, indicate that the maximum on a dipole sounding curve can be caused by a wide variety of lateral changes in resistivity, as well as by leakage of current into the mantle. When this happens, the value for the resistivity-thickness product representing the resistant part of the crust can be underestimated by a large amount. (Modified author abstract)

AD-776 683/9GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
THE ROLE OF FRACTURE ZONES IN SEA FLOOR SPREADING,
Christopher G. A. Harrison, and Mahlon M. Ball. 10 Aug 73, 10p Rept no. Contrib-1667
Contract N00014-67-A-0201-0013, Grant NSF-GA-27465
Revision of report dated 28 Nov 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n32 p7776-7785, 10 Nov 73.

Descriptors: *Ocean ridges, *Faults(Geology), Structural geology.
Identifiers: Plate tectonics, *Ocean bottom spreading.

Considerations of the differential movement between North and South America suggest that many of the fracture zones offsetting the mid-Atlantic ridge in the equatorial Atlantic Ocean are not ridge-ridge transform faults. Instead, the authors show that these fracture zones are active left lateral faults to the west of the ridge crest; this left lateral movement is necessary to accommodate the differential movement between the two Americas. The Owen fracture zone in the northwest Indian Ocean and a fracture zone offsetting the Pacific-Antarctic ridge also show similar features; they show active faulting outside the ridge offset and progressive increase in offset produced by differential spreading rates. Because much strike slip faulting along fracture zones does not produce significant earthquake activity, plate boundaries cannot be defined solely on the basis of the occurrence of active earthquake zones. (Author)

AD-776 686/8GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
SEDIMENTARY SERPENTINITES FROM THE MID-ATLANTIC RIDGE,
Enrico Bonatti, Jose Honnorez, and Stefan Gartner, Jr. 9 Feb 73, 9p Rept no. Contrib-1648
Contract N00014-67-A-0201-0013, Grant NSF-GA-25163
Revision of report dated 24 Jul 72.
Availability: Pub. in Jnl. of Sedimentary Petrology, v43 n3 p728-735 Sep 73.

Descriptors: *Ocean ridges, *Atlantic Ocean, Sedimentary rock, Petrology, Sedimentation.
Identifiers: Romanche Fracture Zone, Serpentinite, MidAtlantic Ridge.

Indurated sedimentary rocks with serpentine minerals as major components were recovered from the lower slopes of transverse ridges associated with the Romanche Fracture Zone in the equatorial Mid-Atlantic Ridge. In addition to serpentine minerals, sedimentary serpentinites from the Mid-Atlantic Ridge contain grains of diopside, enstatite, tremolite, chlorite, calcite and, frequently, calcareous microfossils: some samples display layering and graded bedding. These sedimentary serpentinites were emplaced by gravity sliding, slumping and turbidity current transport of serpentinite masses originating from the upper levels of ultramafic transverse ridges at the Romanche Fracture. Chemical and mineralogical differences between the sedimentary serpentinites and their ultramafic source rocks are discussed. The rocks in question are identical to sedimentary serpentinites common in alpine-type orogenic areas of the world. (Author)

AD-776 688/4GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
GEOTECTONIC EVOLUTION AND SUBSIDENCE OF BAHAMA PLATFORM: DISCUSSION,
Carolyn Glockhoff. 1 Feb 73, 4p Rept no. Contrib-1639
Contract N00014-67-A-0201-0013, Grant NSF-GA-27465
Sponsored in part by Grant NSF-GD-31576. Revision of report dated 7 Jul 72.
Availability: Pub. in Geological Society of America Bulletin, v84 p3473-3476 Oct 73.

Descriptors: *Bahama Islands, *Tectonics, Ocean ridges, North Atlantic Ocean, Sediments.
Identifiers: Evolution(Development), Plate tectonics.

The model for formation of the Bahamas presented by Dietz and others (1970) calls for a history of discrete events. Continuous uplift at the mid-oceanic ridge, spreading, and sinking of the oceanic crust along the continents could produce the same features without necessarily requiring long interruptions in development. (Author)

AD-776 696/7GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
ORIGIN OF OFFSETS OF THE MID-ATLANTIC RIDGE IN FRACTURE ZONES,
Enrico Bonatti. 31 Oct 72, 10p Rept no. Contrib-1591
Contract N00014-67-A-0201-0013, Grant NSF-GA-25163
Revision of report dated 13 Jul 72.
Availability: Pub. in Jnl. of Geology, v81 n2 p144-156 Mar 73.

Descriptors: *Ocean ridges, *Atlantic Ocean, *Tectonics, Structural geology, Faults(Geology), Earth models.
Identifiers: Ocean bottom spreading, MidAtlantic Ridge.

The axis of the Mid-Atlantic Ridge is offset laterally at several locations by tectonic fractures running perpendicular to its elongation. These fractures are manifested by trenches running east-west, cutting through and displacing the axis of the Mid-Atlantic Ridge. Steep and elevated ridges can be observed running parallel to the trenches, thus perpendicular to the axis of the Mid-Atlantic Ridge; they are called here transverse ridges or transverse blocks. In this paper, some features peculiar to transverse ridges are discussed. The author presents a hypothesis concerning the origin of the offsets of the equatorial Mid-Atlantic Ridge and of the African and South American continental margins.

AD-776 703/1GA Reprint
Colorado State Univ Fort Collins Dept of Geology
LONGITUDINAL RIPPLES FORMED BY OVERLAND FLOW AND TIDAL CURRENTS,
M. P. Mosley. 8 Mar 73, 5p AROD-8525.6-EN
Grant DA-ARO-D-31-124-70-G13
Revision of report dated 11 Dec 72.
Availability: Pub. in Jnl. of Sedimentary Petrology, v43 n3 p795-798 Sep 73.

Descriptors: *Soil erosion, *Sedimentation, *Sedimentology, *Tides, Ripples, Ocean currents, Atmospheric precipitation, Fluid flow, Mud.
Identifiers: *Ripple marks, Mudflats.

Longitudinal ripple marks similar in size and appearance to those reported on tidal mudflats

developed under the influence of artificial precipitation and overland flow during an experimental study of soil erosion. They appeared to be an upslope extension of the incised channel system, accomplishing the most efficient evacuation of water from the experimental surface. The longitudinal ripples formed under overland flow tended to be more sinuous and to branch more frequently than those formed by tidal currents. In terms of fluid flow dynamics, longitudinal ripples formed under overland flow and tidal flow may be functionally similar, but environmental conditions are quite different. That these features may develop in different environments may introduce some difficulty into interpretation of such forms found in the geologic record. (Author)

AD-776 708/0GA Reprint
Colorado State Univ Fort Collins Dept of Geology
RAINSPLASH AND THE CONVEXITY OF BADLAND DIVIDES,
Michael Paul Mosley. 1973, 19p Rept no. 8 AROD-8525.7-EN
Grant DA-ARO-D-31-124-70-G13
Summaries in German and French.
Availability: Pub. in Zeitschrift fuer Geomorphologie N.F. Suppl. Bd. 18 p10-25 Dec 73.

Descriptors: *Soil erosion, *Arid land, *Geomorphology, Raindrops, Impact, Test methods, Computerized simulation.

It is suggested that rainsplash, in which debris particles are thrown clear of the ground, is in some cases partly responsible for the convex profile of badland divides. An experimental study provided data for the relationship between weight of sand splashed by waterdrop impact, distance from source, and slope angle. A computer simulation using these data showed that the bank of a vertically incised gully would, under the influence of rainsplash, develop a convexity which would extend at the expense of the vertical face and of the upper horizontal surface. Model slope profiles strikingly similar to the simulated profiles developed during an experimental study of rainsplash erosion. Other processes, such as rolling and sliding of particles, were also in evidence on the steeper model slopes. (Modified author abstract)

AD-776 716/3GA Reprint
Rochester Univ N Y
DERIVATION AND EVALUATION OF A MECHANICAL MODEL FOR SHEET INTRUSIONS,
David D. Pollard. 23 Oct 72, 37p AROD-10538.3-EN
Grant DA-ARO-D-31-124-72-G149
Availability: Pub. in Tectonophysics, v19 p233-269 1973.

Descriptors: *Structural geology, *Igneous rock, *Intrusion, Models, Elastic properties, Deformation.
Identifiers: Magmatism, Intrusive rocks.

A two-dimensional mechanical model for sheet intrusions based on the elastic deformation around a pressurized elliptical hole is derived. After evaluating the effects of irregularities in contact shape, possible magma pressure distributions, regional boundary conditions, host rock properties, and interference from adjacent intrusions the model can be applied with confidence to understand many features associated with dike or sill emplacement. Three mechanisms for sheet intrusion propagation are extension fracturing, brittle faulting, and ductile faulting. This deformation is concentrated at the intrusion termination, the site of large principal stress differences and large stress gradients. (Modified author abstract)

AD-776 828/6GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
NEWFOUNDLAND OPHIOLITES AND THE GEOLOGY OF THE OCEANIC LAYER,
J. J. Peterson, P. J. Fox, and E. Schreiber. 1974, 6p Rept no. LDGO-2008
Contract N00014-67-A-0108-0004
Prepared in cooperation with Queens Coll., Flushing, N. Y. Dept. of Earth and Environmental Sciences and State Univ. of New York, Albany. Dept. of Geological Sciences.
Availability: Pub. in Nature, v247 n5438 p194-196, 25 Jan 74.

Descriptors: *Igneous rock, Acoustic velocity, Earth crust, Ocean bottom, Earth models, Newfoundland(Province).
Identifiers: Gabbro, Dolerite, *Ophiolites.

The compressional wave velocities of 32 gabbros and cummulate gabbros and 27 greenschist facies meta-dolerites have been measured in the laboratory. At a confining pressure of 1.5 kb (calculated in situ lithostatic pressure of Layer 3) the meta-dolerites ranged in velocity from 6.5 to 6.8 km/sec and the gabbros ranged in velocity from 7.0 to 7.8 km/sec. Accepting the proposition that ophiolites are representative of oceanic crust, the authors conclude from their data that the upper portion of the oceanic layer (Layer 3A) is composed predominantly of sheeted meta-dolerite. The lower portion of the oceanic layer (Layer 3B) is composed predominantly of gabbro and cummulate gabbro. (Modified author abstract)

AD-776 852/6GA Reprint
Sibley School of Mechanical and Aerospace Engineering Ithaca N Y
CONVECTION IN THE EARTH'S MANTLE,
D. L. Turcotte, K. E. Torrance, and A. T. Hsui. 1973, 26p AFOSR-TR-74-0408
Contract F44620-69-C-0063, Grant NGR-33-010-108
Sponsored in part by Grant NSF-GK-4656.
Availability: Pub. in Methods in Computational Physics, v13 p431-454 1973.

Descriptors: *Earth mantle, *Convection, Heat transfer, Magnetic anomalies, Tectonics, Continental shelves, Thermal properties, Numerical analysis.
Identifiers: *Plate tectonics.

Computers have played an important role in solving for the global circulation of the oceans and atmosphere. With the general acceptance of thermal convection within the Earth's mantle it is natural to turn to the computer to solve for these flows. The authors review briefly the knowledge of surface displacements because these displacements place important constraints on possible mantle flows. They next review present understanding of the mantle and its relevant physical and chemical properties. The applicable equations and the numerical techniques are presented. Some of the results obtained are shown and possible future calculations are discussed. (Author)

AD-776 856/7GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
ANCIENT CONTINENTAL MANTLE BENEATH OCEANIC RIDGES,
Enrico Bonatti. 10 Feb 71, 8p Rept no. Contrib-1343
Contract Nonr-4008(02), Grant NSF-GA-1602
Revision of report dated 4 Nov 70.
Availability: Pub. in JnL of Geophysical Research, v76 n17 p3825-3831, 10 Jun 71.

Descriptors: *Ocean ridges, *Earth mantle, *Structural geology, Igneous rock, Petrology, Gravity.
Identifiers: Ultramafic rocks, Ocean bottom spreading.

Speculations on the nature of the oceanic mantle are based primarily on seismic refraction, gravity and heat flow measurements at sea, and on petrological studies of igneous rocks collected from the sea floor. Data obtained recently from study of oceanic ultramafic rocks may modify somewhat our concepts of the nature of the oceanic mantle. These data are reviewed here, and an attempt is made to reconcile them with the geophysical evidence.

AD-776 857/5GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
FISSURE BASALTS AND OCEAN-FLOOR SPREADING ON THE EAST PACIFIC RISE,
Enrico Bonatti. 12 Sep 69, 3p Rept no. Contrib-1126
Contract Nonr-4008(02), Grant NSF-GA-1602
See also AD-776 867.
Availability: Pub. in the Science, v166 p1181-1183, 28 Nov 69.

Descriptors: *Ocean ridges, *South Pacific Ocean, *Marine geology, Ocean bottom, Basalt, Tectonics.
Identifiers: *Ocean bottom spreading, East Pacific Rise.

The paper contains comments by R. P. von Herzen and Bonatti's reply to the comments concerning a previous paper on the nature and mechanism of emplacement of basalt outcroppings on the crest of the East Pacific Rise.

AD-776 862/5GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
ORIGIN OF THE GULF AND CARIBBEAN AND IMPLICATIONS REGARDING OCEAN RIDGE EXTENSION, MIGRATION, AND SHEAR,
M. M. Ball, and C. G. A. Harrison. 1969, 8p Rept no. Contrib-1091
Contract Nonr-4008(02), Grant NSF-GA-1464
Also supported in part by Grants NSF-GP-5012, NSF-GA-4302 and NSF-GA-4569.
Availability: Pub. in Transactions-Gulf Coast Association of Geological Societies, v19 p287-294 1969.

Descriptors: *Mexico Gulf, *Caribbean Sea, *Tectonics, Ocean ridges, Earth crust, Faults(Geology), Shear properties.
Identifiers: *Ocean bottom spreading, Plate tectonics.

The main contention of this paper is that the Gulf and Caribbean lie in a zone of north-south extension and left-lateral shear between crustal areas spreading in different directions at different rates. Ridge migration and extension have been explained as a result of spreading; shear of the ridge has been explained as a result of spreading rate variation.

AD-776 864/6GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
TECTONIC CONTROL OF THE CONFIGURATION OF THE BAHAMA BANKS,
M. Ball. 1967, 4p Rept no. Contrib-834
Contract Nonr-4008(02)
Availability: Pub. in Transactions of the Gold Coast Association of Geological Societies, v17 p265-267 1967.

Descriptors: *Bahama Islands, *Structural geology, Gravity, Ocean bottom topography, Sedimentation.

The paper discusses regional geophysical and geologic data from the Bahamas and other carbonate platform areas both ancient and contemporary. The main conclusion based on these data is that tectonism, i.e., some combination of folding and faulting, in the platform's foundation, has been the factor governing the configuration of these platforms.

AD-776 867/4GA Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
FISSURE BASALTS AND OCEAN-FLOOR SPREADING ON THE EAST PACIFIC RISE,
Enrico Bonatti. 15 May 68, 5p
Availability: Pub. in Science, v161 p886-888, 30 Aug 68.

Descriptors: *Ocean ridges, *South Pacific Ocean, *Marine geology, Ocean bottom, Basalt, Petrology, Sediments, Tectonics.
Identifiers: *Ocean bottom spreading, East Pacific Rise.

A basalt pavement outcrops almost continuously in a band along the crestal region of the East Pacific Rise from about 14 degrees S to 6 degrees that is, for more than 800 kilometers; the outcrop may well extend beyond the above limits along the axis of the rise. The basalt band is generally between 40 and 60 kilometers wide and is replaced laterally by sediment. The lavas are fresh, 'oceanic tholeiites' which were emplaced less than 1 million years ago by fissure eruptions. These findings can be explained by the hypothesis of ocean-floor spreading; the basalts are the expression of material originating from the mantle and rising through fissures along the axis of the ridge. The absence of an axial rift valley on the East Pacific Rise may be explained by the fact that large volumes of lava are being outpoured along its crest. (Author)

AD-776 888/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INFRARED RADIOMETER FOR GEOLOGICAL MAPPING,
V. A. Verbitskii, A. G. Grammakov, B. M. Kolomytsev, and G. S. Smirnov. 11 Mar 74, 7p
Rept no. FTD-HT-23-912-74
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) v15 n3 p110-111 1972, by Frank C. Vaughn.

Descriptors: *Geological survey, *Radiometers, Infrared detectors, Mapping, Translations, USSR.
Identifiers: Remote sensing.

In the article the operating principle and operation of an infrared radiometer with a constant field of vision angle, which was designed for geological mapping from the natural infrared radiation of the earth, are described. A block-diagram is provided and the basic parameters of the instrument, obtained during laboratory and field tests of the radiometer, are presented.

E74-10380 PC$4.00/MF$1.45
Geological Survey, Reston, Va.
IRON-ABSORPTION BAND ANALYSIS FOR THE DISCRIMINATION OF IRON-RICH ZONES.
Progress rept. 1 Jul-31 Dec 73,
Lawrence C. Rowan. 30 Jan 74, 11p NASA-CR-137165
Contract NASA Order S-70243-AG-4

Descriptors: Iron ores, Mineral exploration, Spectral reflectance, Absorption spectra, Infrared spectra, Nevada, Earth resources program, Rocks, Data processing, Radiometers, Multispectral photography, Mineralogy.

The author has identified the following significant results. Most major rock units and unaltered and altered areas in the study area can be discriminated on the basis of visible and near-infrared spectral reflectivity differences recorded from satellite altitude. These subtle spectral differences are detectable by digital ratioing of the MSS bands and subsequent stretching to increase the contrast to enhance spectral differences. Hydrothermally altered areas appear as anomalous color patches within the volcanic-rock areas. A map has been prepared which can be regarded as an excellent reconnaissance exploration map, for use in targeting areas for more detailed geological, geochemical, and geophysical studies. Mafic and felsic rock types are easily discriminated on the color stretched-ratio composite. The rationing process minimizes albedo effects, leaving only the recorded characteristic spectral response. The spectra of unaltered rocks appear different from those of altered rocks, which are typically dominated by limonite and clay minerals. It seems clear that differences in spectral shape can provide a basis for discrimination of geologic material, although the relations between visible and near-infrared spectral reflectivity and mineralogical composition are not yet entirely understood.

E74-10385 PC$4.00/MF$1.45
Geological Survey, Reston, Va.
SATELLITE GEOLOGICAL AND GEOPHYSICAL REMOTE SENSING OF ICELAND.
Progress rept. 1 Sep-31 Oct 73,
Richard S. William, Jr. 1 Nov 73, 8p NASA-CR-137170

Descriptors: Geophysics, Iceland, Geothermal resources, Geomorphology, Earth resources program, Volcanology, Structural properties(Geology), Glaciology.

The author has identified the following significant results. Rhyolitic rocks in the Torfajokull geothermal area and geothermally altered ground in the Torfajokull and Reykjanes geothermal areas can also be delineated. The fallout pattern of tephra from the 1970 eruption from the volcano Hekla can be mapped where sufficient depth of deposition destroyed the vegetation. Standard NDPF 70mm negatives (3rd generation) were used to print enlargements of the volcanic islands of Surtsey and Heimaey. Sufficient resolution is maintained to directly update maps to the 1:100,000 scale. Low-sun angle imagery (<10 deg) of Iceland has been particularly valuable in mapping new structural and volcanic features hidden beneath glacial ice in Iceland's neovolcanic zone. ERTS-1 imagery has shown the marked differences in volcanic landforms in Iceland from a regional viewpoint. The regional distribution of crater rows, moberg ridges, table (moberg) mountains, calderas, central volcanoes, and shield volcanoes shows striking differences in volcanic geomorphology in different parts of Iceland's neovolcanic zone.

PB-230 213/1GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
COAL PETROLOGY AND ITS APPLICATION. THE EFFECT OF TEMPERATURE ON REFLECTANCE ANALYSES.
Open rept.,
L. M. Juckes. Feb 74, 8p GS/OPER/99/2/73/C

Descriptors: *Coal, *Reflectance, Temperature, Optical properties, Petrology, Great Britain.

The effects of temperature variation on the reliability of coal reflectance analyses have been examined and charts produced showing the errors which can arise. In general it is best to ignore variations in temperature and to assume one constant temperature when calculating the reflectances of standards. The standard against which the coal is compared should preferably have a slightly higher reflectance value than the coal. In such cases errors are negligible over the range 20-35C.

PB-230 242/0GA PC$10.00/MF$1.45
Purdue Univ., Lafayette, Ind. Water Resources Research Center.
FORM AND FLUVIAL PROCESSES IN ALLUVIAL STREAM CHANNELS.
Doctoral thesis,
Edward Anthony Keller. May 73, 139p W74-05819, OWRR-A-022-IND(3)

Descriptors: *Channels(Waterways), *Geomorphology, Streams, Networks, Alluvium, Evolution(Development), Theses.

The problem was to define quantitatively and qualitatively, for alluvial channels, selected aspects of form and fluvial processes which contribute to the development of fluvial systems. A five-stage model is proposed to explain the development of alluvial channels. The model is based upon channel morphology, channel morphometry, and qualitative conclusion based on numerous field observations. A generic classification is suggested, which permits hierarchical ranking of common bed forms in straight, sinuous, and meandering alluvial channels. Two major subdivisions: channel-forming and channel-altering bed forms are proposed.

PB-230 773/4GA PC$4.00/MF$1.45
Iowa State Univ., Ames. Engineering Research Inst.
ADSORPTION ENERGIES AND SWELLING PRESSURES OF MONTMORILLONITE.
Final rept. Oct 69-Sep 72,
R. L. Handy, T. Demirel, T. Ruenkrairergsa, and T. Olson. Jul 73, 97p ISU-ERI-AMES-73110
Grant NSF-GK-10191
Presented at Annual Clay Minerals Conference (22nd), Oct 73.

Descriptors: *Clays, *Montmorillonite, *Adsorption, *Swelling, *X ray diffraction, Water, Crystal structure, Interstitials, Elastic properties, Consolidation, Hysteresis, Hydration, Compression, Phlogopite, Pressure.

Earlier estimates of the expansion energy of montmorillonite clay from adsorption of interlayer water have been based on adsorption isotherm data, whereby the sample weight is precisely determined in relation to the partial pressure of water vapor. Similar relationships to interlayer d001 spacings were shown by x-ray diffraction from clay samples confined under the same conditions on a diffractometer. A considerable hysteresis was revealed in both types of tests, indicated by variations of weight and d-spacings at a particular pressure, depending on whether the sample was adsorbing or desorbing. From a comparison of the data from both tests, it was possible to predict expansion and consolidation pressures in relation to the clay d001 spacing, and hence to its degree of hydration or hydration state. A main goal of this investigation was to test the above arguments by direct x-ray measurement of d001 spacings while the clay is held under a regulated consolidating pressure. A special x-ray consolidometer was built for this study. (Modified author abstract)

UCRL-51441 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
TECHNIQUE FOR GENERATING PRESSURE-VOLUME RELATIONSHIPS AND FAILURE ENVELOPES FOR ROCKS.
T. R. Butkovich. 1 Nov 73, 36p
Contract W-7405-eng-48

Descriptors: (*Rocks, *Mechanical properties), (*Computer codes, *P codes), Nuclear explosions, Underground explosions.

For abstract, see NSA 29 07, number 15536.

8H. Hydrology and Limnology

AD-776 490/5GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
FLUME EXPERIMENTS ON THE TRANSITION FROM RIPPLES TO LOWER FLAT BED WITH INCREASING SAND SIZE,
John B. Southard, and Lawrence A. Boguchwal. 25 Jun 73, 10p
Contract N00014-67-A-0204-0048
Revision of report dated 28 Feb 73.
Availability: Pub. in Jnl. of Sedimentary Petrology, v43 n4 p1114-1121 Dec 73.

Descriptors: *Sediment transport, *Grain size, Water flow, Velocity, Topography.

Observations were made in a small flume with three sizes of very well sorted quartz sand at constant mean flow depth to study in detail the relationship between ripples in finer sands and the lower-flat-bed mode of transport at similar flow velocities in coarser sands. A graph of mean flow velocity vs. sediment size for a flow depth of 7 cm plotted from the flume runs shows that in the size interval from 0.6 mm to 0.7 mm the lower flat bed intervenes between ripples at lower flow velocities and dunes at higher flow velocities, so that the sequence of bed configurations in these sizes is more complicated than for either finer or coarser sands. The ripple field pinches out with increasing size at about 0.7 mm. There is a triple point involving ripples, dunes, and lower flat bed at about 0.6 mm. (Author)

AD-776 705/6GA Reprint
Louisiana State Univ Baton Rouge Coastal Studies Inst
DISCHARGE PATTERNS IN TWO CREVASSES OF THE MISSISSIPPI RIVER DELTA.
Technical rept.,
David J. Arndorfer. 7 Aug 73, 22p Rept no. TR-158
Contract N00014-69-A-0211-0003
Prepared in cooperation with Wisconsin Univ., Oshkosh. Dept. of Geography.
Availability: Pub. in Marine Geology, v15 p269-287 1973.

Descriptors: *Deltas, *Sedimentation, Channels(Waterways), Water flow, Tides.
Identifiers: *Mississippi River Delta.

The report evaluates variables which control water discharge in Rattlesnake Crevasse and, to a lesser extent, Little Lake Pond Crevasse, in the Mississippi River Delta. Multiple-regression and analysis-of-variance procedures assess the spatial and temporal interaction and changes in intensity of the variables. River stage, local drainage conditions, semi-monthly tide, diurnal tide, and wind are factors which determine discharge patterns in these two delta crevasses. The discharge of Rattlesnake and Little Lake Pond crevasses complements that of the primary distributaries of the Mississippi River Delta. During flooding tide, when seaward flow is inhibited in delta distributaries, the two crevasses attain maximum discharge. Flow in Rattlesnake Crevasse reverses direction during moderate and low river stages. (Author)

AERE-R-7540 PC$4.50/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
RADIOACTIVE FALLOUT IN AIR AND RAIN: RESULTS TO THE MIDDLE OF 1973.
R. S. Cambray, E. M. R. Fisher, A. Parker, and D. H. Peirson. Dec 73, 48p
U.S. Sales Only.

Descriptors: (*United kingdom, *Fallout deposits), (*Surface air, *Radioactivity), (*Rain, Radioactivity), (*Cesium 137, *Radiation monitoring), Atmospheric explosions, China, Fission products, Global fallout, Local fallout, Nuclear explosions, Pacific ocean, Radiation hazards, Strontium 90, Washout.

For abstract, see NSA 29 07, number 15603.

BNL-18350 PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
ENVIRONMENTAL SAFETY EVALUATIONS FOR NUCLEAR INSTALLATIONS.
A. P. Hull. 1973, 23p CONF-731127-1

Descriptors: (*Nuclear industry, *Radiation hazards), (*Human populations, Radiation hazards), Fuel reprocessing plants, Nuclear power plants, Radiation doses, Radiation monitoring, Radioactive waste disposal, Reactor safety, Safety, Site selection.

For abstract, see NSA 29 07, number 15566.

BNWL-SA-4839 PC$3.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ENVIRONMENTAL MONITORING AT THE PACIFIC NORTHWEST LABORATORY BY BATTELLE-NORTHWEST.
J. P. Corley. Oct 73, 21p CONF-731109-2
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Human populations, *Radiation doses), Columbia river, Environment, Gaseous wastes, Liquid wastes, Maximum permissible activity, Planning, Radiation protection, Radioactivity, Radionuclide migration, Safety standards, Soils, Underground disposal.

For abstract, see NSA 29 07, number 15571.

COM-74-10728/5GA PC$14.25/MF$1.45
National Weather Service, Silver Spring, Md. Office of Hydrology.
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM--SNOW ACCUMULATION AND ABLATION MODEL.
Technical memo.,
Eric A. Anderson. Nov 73, 223p NOAA-TM-NWS-HYDRO-17 NOAA-74031201

Descriptors: *Flood forecasting, *Computer programs, Snowfall, Snow cover, Snowmelt, Stream flow, Atmospheric temperature, Precipitation(Meteorology), Watersheds, Mathematical models.
Identifiers: TEMPADJ computer program.

The Technical Memorandum describes a conceptual model of the snow accumulation and ablation process and the associated computer subroutines and programs which enable the model to be used in conjunction with the National Weather Service River Forecast System (NWSRFS). Guidelines and methods for determining model parameter values for a given area are also presented. Even though the snow subroutines are written for use with the NWSRFS, the snow accumulation and ablation model itself can be used with almost any soil-moisture accounting (rainfall-runoff relationship) and channel routing procedure. The output from the snow model would be the input to the soil-moisture accounting procedure. The output from the snow model is snowpack outflow (snowmelt water and rainwater leaving the snowpack) plus rain that fell on bare ground.

HW-72691-1 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
SUMMARY OF RADIOLOGICAL DATA FOR THE MONTH OF JANUARY 1962.
R. F. Foster. 14 Feb 62, 9p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), Arsenic 76, Chromium 51, Columbia river, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15572.

HW-72691-3 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
SUMMARY OF RADIOLOGICAL DATA FOR THE MONTH OF MARCH 1962.
R. F. Foster. 12 Apr 62, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Phosphorus 32, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Arsenic 76, Beta sources, Columbia river, Drinking water, Environment, External irradiation, Food chains, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Man, Milk, Neptunium 239, Personnel, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters.

For abstract, see NSA 29 07, number 15573.

HW-72691-4 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
SUMMARY OF RADIOLOGICAL DATA FOR THE MONTH OF APRIL 1962.
R. F. Foster. 11 May 62, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Phosphorus 32, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Arsenic 76, Beta sources, Columbia river, Drinking water, Environment, External irradiation, Food chains, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Man, Milk, Neptunium 239, Personnel, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters.

For abstract, see NSA 29 07, number 15574.

HW-72691-5 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
SUMMARY OF RADIOLOGICAL DATA FOR THE MONTH OF MAY 1962.
R. F. Foster. 11 Jun 62, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Phosphorus 32, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Arsenic 76, Beta sources, Columbia river, Drinking water, Environment, Food chains, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Man, Milk, Neptunium 239, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Uptake.

For abstract, see NSA 29 07, number 15575.

HW-76525-1 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR JANUARY 1963.
R. F. Foster. 12 Feb 63, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Columbia river, Radiation monitoring), Air, Beta sources, Chemical properties, Drinking water, Environment, Fallout, Fishes, Gastrointestinal tract, Iodine 131, Maximum permissible concentration, Milk, Phosphorus 32, Radiation doses, Radioactive wastes, Radioactivity, Radionuclide migration, Separation processes, Stack disposal, Water.

For abstract, see NSA 29 07, number 15604.

HW-76525-10 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.

RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR OCTOBER 1963.
R. F. Foster. 12 Nov 63, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), Arsenic 76, Beta sources, Columbia river, Drinking water, Environment, Gamma sources, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters.

For abstract, see NSA 29 07, number 15578.

HW-76525-11 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR NOVEMBER 1963.
R. F. Foster. 12 Dec 63, 9p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), Arsenic 76, Chromium 51, Columbia river, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15579.

HW-76525-12 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR DECEMBER 1963.
R. F. Foster. 10 Jan 64, 8p

Descriptors: (*Hapo, *Radiation monitoring), (*Phosphorus 32, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Arsenic 76, Beta sources, Columbia river, Drinking water, Environment, Gamma sources, Gaseous wastes, Gastrointestinal tract, Human populations, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Radiation doses, Radioactive waste disposal, Radionuclide migration, Sampling, Surface air, Surface waters, Uptake.

For abstract, see NSA 29 07, number 15580.

HW-76525-2 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR FEBRUARY 1963.
R. F. Foster. 11 Mar 63, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Columbia river, Radiation monitoring), Air, Beta sources, Chemical properties, Drinking water, Environment, Fallout, Fishes, Gastrointestinal tract, Iodine 131, Maximum permissible concentration, Milk, Phosphorus 32, Radiation doses, Radioactive wastes, Radioactivity, Radionuclide migration, Separation processes, Stack disposal, Water.

For abstract, see NSA 29 07, number 15605.

HW-76525-3 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR MARCH 1963.
R. F. Foster. 11 Apr 63, 7p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Columbia river, Radiation monitoring), Air, Beta sources, Chemical properties, Drinking water, Environment, Fallout, Fishes, Gastrointestinal tract, Iodine 131, Maximum permissible concentration, Milk, Phosphorus 32, Radiation doses, Radioactive wastes, Radioactivity, Radionuclide migration, Separation processes, Stack disposal, Water.

For abstract, see NSA 29 07, number 15606.

HW-76525-4 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR APRIL 1963.
R. F. Foster. 13 May 63, 7p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Columbia river, Radiation monitoring), Air, Beta sources, Chemical properties, Drinking water, Environment, Fallout, Fishes, Gastrointestinal tract, Iodine 131, Maximum permissible concentration, Milk, Phosphorus 32, Radiation doses, Radioactive wastes, Radioactivity, Radionuclide migration, Separation processes, Stack disposal, Water.

For abstract, see NSA 29 07, number 15607.

HW-76525-5 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR MAY 1963.
R. F. Foster. 13 Jun 63, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Columbia river, Radiation monitoring), Air, Beta sources, Chemical properties, Drinking water, Environment, Fallout, Fishes, Fission products, Fuel elements, Gastrointestinal tract, Iodine 131, Maximum permissible concentration, Milk, Phosphorus 32, Radiation doses, Radioactive wastes, Radioactivity, Radionuclide migration, Separation processes, Stack disposal, Water.

For abstract, see NSA 29 07, number 15608.

HW-76525-6 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR JUNE 1963.
R. F. Foster. 12 Jul 63, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Columbia river, Radiation monitoring), Air, Beta sources, Chemical properties, Drinking water, Environment, Fallout, Fishes, Gastrointestinal tract, Iodine 131, Maximum permissible concentration, Milk, Phosphorus 32, Radiation doses, Radioactive wastes, Radioactivity, Radionuclide migration, Separation processes, Stack disposal, Water.

For abstract, see NSA 29 07, number 15609.

HW-76525-8 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR AUGUST 1963.
R. F. Foster. 10 Sep 63, 6p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), Arsenic 76, Chromium 51, Columbia river, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15576.

HW-76525-9 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR SEPTEMBER 1963.
R. F. Foster. 10 Oct 63, 8p
Contract AT(45-1)-1350

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), Arsenic 76, Chromium 51, Columbia river, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15577.

HW-80892-10 PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR OCTOBER 1964.
R. F. Foster. 18 Nov 64, 24p

Descriptors: (*Hapo, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Air filters, Arsenic 76, Cesium 137, Columbia river, Drinking water, Environment, Fallout, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Oysters, Phosphorus 32, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Strontium 90, Surface air, Surface waters.

For abstract, see NSA 29 07, number 15587.

HW-80892-11 PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR NOVEMBER 1964.
R. F. Foster. 22 Dec 64, 24p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Chromium 51, Radiation monitoring), Air filters, Arsenic 76, Cattle, Cesium 137, Columbia river, Drinking water, Environment, Fallout, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Oysters, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Strontium 90, Surface air, Surface waters, Thyroid, Zinc 65.

For abstract, see NSA 29 07, number 15588.

HW-80892-12 PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR DECEMBER 1964.
R. F. Foster. 18 Jan 65, 25p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Arsenic 76, Beta sources, Cattle, Cesium 137, Columbia river, Drinking water, Environment, Fallout, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Oysters, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Strontium 90, Surface air, Surface waters, Thyroid.

For abstract, see NSA 29 07, number 15589.

HW-80892-2 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR FEBRUARY 1964.
R. F. Foster. 19 Mar 64, 8p

Descriptors: (*Hapo, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), Arsenic 76, Chromium 51, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Liquid wastes, Milk, Neptunium 239, Radiation doses, Radioactive waste disposal, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15581.

HW-80892-3 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR MARCH 1964.
R. F. Foster. 15 Apr 64, 8p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Beta sources, Radiation monitoring), Arsenic 76, Chromium 51, Columbia river, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15582.

HW-80892-4 PC$3.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR APRIL 1964.
R. F. Foster. 18 May 64, 8p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), Arsenic 76, Chromium 51, Columbia river, Drinking water, Environment, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Surface air, Surface waters, Zinc 65.

For abstract, see NSA 29 07, number 15583.

HW-80892-7 PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR JULY 1964.
R. F. Foster. 11 Aug 64, 24p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), Air filters, Arsenic 76, Cattle, Cesium 137, Chromium 51, Columbia river, Drinking water, Environment, Fallout, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Oysters, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Strontium 90, Surface air, Surface waters, Thyroid, Zinc 65.

For abstract, see NSA 29 07, number 15584.

HW-80892-8 PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR AUGUST 1964.
R. F. Foster. 14 Sep 64, 21p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Beta sources, Radiation monitoring), (*Phosphorus 32, Radiation monitoring), Air filters, Arsenic 76, Cattle, Cesium 137, Chromium 51, Columbia river, Drinking water, Environment, Fallout, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Oysters, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Strontium 90, Surface air, Surface waters, Thyroid, Zinc 65.

For abstract, see NSA 29 07, number 15585.

HW-80892-9 PC$3.25/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
RADIOLOGICAL STATUS OF THE HANFORD ENVIRONS FOR SEPTEMBER 1964.
R. F. Foster. 16 Oct 64, 21p

Descriptors: (*Hapo, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Chromium 51, Radiation monitoring), (*Zinc 65, Radiation monitoring), Arsenic 76, Beta sources, Cattle, Cesium 137, Columbia river, Drinking water, Environment, Fallout, Gaseous wastes, Gastrointestinal tract, Human populations, Ingestion, Internal irradiation, Iodine 131, Liquid wastes, Milk, Neptunium 239, Oysters, Phosphorus 32, Radiation doses, Radioactivity, Radionuclide kinetics, Radionuclide migration, Sampling, Strontium 90, Surface air, Surface waters, Thyroid.

For abstract, see NSA 29 07, number 15586.

LIB/Trans-507 PC$3.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France). Dept. De Protection.
MECHANISMS OF TRANSFER IN CULTIVATED SOILS OF RADIONUCLIDES DISCHARGED BY ELECTRONUCLEAR POWER STATIONS IN THE RIVER STREAM--IRRIGATED SOILS--WATER BED SYSTEM.
A. Saas, and A. Grauby. Jun 73, 27p
Translation of SM--172-57. U.S. Sales Only.

Descriptors: (*Rivers, *Radionuclide migration), (*Soils, Radionuclide migration), (*Nuclear power plants, *Radioactive wastes), (*Sodium 22, *Diffusion), Antimony 124, Cerium 141, Cesium 137, Cobalt 60, Contamination, Industry, Iodine 131, Iron 59, Irrigation, Manganese 54, Pollution, Power plants, Radiation hazards, Strontium 85, Zinc 65.

For abstract, see NSA 29 07, number 15630.

NERC-LV-539-504 PC$3.25/MF$1.45
National Environmental Research Center, Las Vegas, Nev. (Usa).
NOBLE GAS SURVEILLANCE NETWORK, APRIL 1972--MARCH 1973.
V. E. Andrews, and D. T. Wruble. Sep 73, 21p
CONF-730915-11
Contract AT(20-1)-539

Descriptors: (*Nevada test site, *Radiation monitoring), (*Krypton 85, Radiation monitoring), (*Xenon 133, Radiation monitoring), Air samplers, Earth atmosphere, Environment, Human populations, Mechanical efficiency, Nuclear explosions, Quantity ratio, Radiation hazards, Radionuclide migration, Sampling, Surface air.

For abstract, see NSA 29 07, number 15612.

PB-229 830/5GA PC$7.00/MF$1.45
Pennsylvania State Univ., University Park. Inst. for Research on Land and Water Resources.
AN EMPIRICAL MATHEMATICAL MODEL OF AN INTERCONNECTED WATERSHED SYSTEM.
Research project technical completion rept.,
David L. Raphael, and Barron M. Tallman. Feb 74, 80p W74-05543, OWRR-A-022-PA(1)
Contract DI-14-31-0001-4038

Descriptors: *Watersheds, *Surface water runoff, Mathematical models, Methodology, Evapotranspiration, Forecasting, Rainfall, Ground water recharge.

The problem of prediction of surface flow hydrographs resulting from excess rainfall was investigated by applying response surface mapping techniques to estimate parameters as a function of time. An empirical model with two absorbing sectors (surface flow and the sum of the evaportranspiration and seepage loss) was developed and applied to a complex system of interconnected watersheds using hypothetical data and parameters. The model techniques were also applied to predict a surface flow hydrograph for a single real world watershed. (Author)

PB-229 838/8GA PC$14.00/MF$1.45
Kentucky Water Resources Inst., Lexington.
MEASURING THE INTANGIBLE VALUES OF NATURAL STREAMS. PART II. PREFERENCE STUDIES AND COMPLETION REPORT.
Research rept.,
George M. Woolwine, John A. Dearinger, Charles R. Scroggin, and James S. Calvin. Dec 73, 218p
RR-66 OWRR-B-018-KY(2), W74-05538
Contract DI-14-31-0001-3086

Descriptors: *Streams, *Public opinion, *Esthetics, Sociometrics, Kentucky, Statistical analysis, Attitudes, Conservation, Recreation, Questionnaires.

This report describes the work done during Part II of a project which had as its aim the development of a way to quantify those intangible values peculiar to a small stream and its watershed. During the second part of the project: A method was developed whereby peoples' preferences for natural landscapes could be measured. The method utilized projected color slides and a rating system based on the semantic defferential; fourteen preference studies were conducted using different types of subjects and stimuli (color slides); the data were factor analyzed and scores computed for three factors (Natural Beauty, Force and Starkness) for each slide-subject group combination; the scenic content of each slide was measured and related to the factor scores by a series of linear regression equations; the uniqueness ratio approach was modified to include fewer stream characteristics (thirty-seven) and the work of Part I essentially repeated; and a new method of stream evaluation was developed which yields a factor score for a given stream on each of six factors (Scenic Attractiveness, Land Use-Topo., Litter, Aquatic Habitat, Extractive Industry, Development).

PB-229 847/9GA PC$6.75/MF$1.45
Missouri Univ., Rolla. Dept. of Geology and Geophysics.
THE DETECTION OF SUBSURFACE STREAM CHANNELS IN CARBONATE ROCKS BY GEOELECTRICAL METHODS.
Completion rept.,
Reinhard K. Frohlich, and Gregory P. Smith. 14 Feb 74, 72p W74-05541, OWRR-A-065-MO(1)
Contract DI-14-31-0001-3825

Descriptors: *Geophysical prospecting, *Karst, *Hydrogeology, Missouri, Ground water, Logan Creek, Electrical prospecting, Gravimetric prospecting, Seismic refraction method, Subsurface structures.
Identifiers: Ellington fault.

The distinction of partially dissolved from compact carbonate rocks and from the alluvial overburden is a major problem in geological engineering and water resources. Geoelectrical depth soundings after Schlumberger were applied over karst terraines in three locations of the Ozarks in Missouri. The main part of the investigation was directed towards solving the underground flow and disappearance of Logan Creek near Ellington, Missouri. Combined geoelectrical and gravity surveys under consideration of some near surface seismic refractions indicate zones of increased depth and degree of dissolution at the Ellington Fault. (Modified author abstract)

PB-230 026/7GA PC$3.00/MF$1.45
Geological Survey, Tacoma, Wash. Water Resources Div.
FLOOD PROFILES AND INUNDATED AREAS ALONG THE LOWER NISQUALLY RIVER, WASHINGTON.
Final rept.,
J. E. Cummans. Oct 73, 17p USGS/WRD-74-004, USGS/WRI-42-73

Descriptors: *Nisqually River, *Floods, Washington(State), Flooding, Flood plains.

Nisqually River flood profiles, covering the reach from near the river mouth to river mile 6.4, indicate that the main channel will convey without overflow discharges as large as about 21,000 cubic feet per second; this discharge has a 6-year recurrence interval. The banks in some areas will be overtopped at 25,500 cubic feet per second, which has a 13-year recurrence interval. Determined for six flood-profile stations were areas where overbank flooding first occurs and water-surface profiles of 3.4-year and 100-year floods. Alder and La Grande Reservoirs can reduce the magnitude of lower annual flood peaks downstream to some extent, but insufficient data are available to allow prediction of their effects on very large floods. (Author)

PB-230 188/5GA PC$3.75/MF$1.45
Geological Survey, Austin, Tex. Water Resources Div.
EFFECTS OF URBANIZATION ON FLOODS IN THE DALLAS, TEXAS, METROPOLITAN AREA.
Water-resources investigations (Final),
George R. Dempster, Jr. Jan 74, 57p USGS-WRI-60-73, USGS-WRD-74-003

Descriptors: *Flooding, *Urbanization, Surface water runoff, Watersheds, Floods.
Identifiers: *Dallas(Texas), *Urban hydrology.

The effects of urbanization on flood characteristics of streams in the Dallas metropolitan area were studied by use of a digital model of the hydrologic system, which was calibrated by using observed data from 19 storms in six basins to estimate peak discharges and flood volumes and to simulate a 57-year record of annual peak discharges in 14 basins. The flood-frequency characteristics were defined by fitting the simulated 57-year record to a log-Pearson Type III distribution. The data indicate that in a fully developed residential area, with 37 percent impervious area, the average annual direct runoff is about double that of an undeveloped area. (Modified author abstract)

PB-230 241/2GA PC$9.75/MF$1.45
Purdue Univ., Lafayette, Ind. Water Resources Research Center.
SPECTRAL ANALYSIS AND ITS APPLICATIONS TO HYDROLOGIC TIME SERIES OF LOWER OHIO TRIBUTARIES.
Master's thesis,
Hagop Leon Shahabian. Aug 73, 132p W74-05820, OWRR-B-036-IND(3)

Descriptors: *Spectrum analysis, *Watersheds, Ohio River basin, Surface water runoff, Rainfall, Theses, Computer programs, Stochastic processes, Regression analysis.

Spectral analysis is applied to develop a model for the monthly runoff sequence. The autoregressive scheme is adequate to represent the normalized standardized monthly sequences. A comparison of the spectral and parametric estimation of the model parameters is performed for their respective generating capabilities. The monthly rainfalls are analyzed using the same spectral technique. The normalized standardized series do not differ sensibly from a white noise or uncorrelated random variables. The rainfall-runoff relationship is analyzed by the cross-spectral technique and it is found that the linear system for the two series does not explain the relationship adequately. (Modified author abstract)

PB-230 401/2GA PC$4.50/MF$1.45
Maryland Univ., College Park. Water Resources Research Center.
THE TRANSIENT BEHAVIOR OF RECHARGE-DISCHARGE AREAS IN REGIONAL GROUND-WATER SYSTEMS.
Technical rept.,
Ming-Te Tseng, Robert M. Ragan, and Yaron M. Sternberg. Dec 72, 107p TR-12 W73-09105, OWRR-A-017-MD(1)
Contract DI-14-31-0001-3220

Descriptors: *Ground water, *Hydrodynamics, Mathematical models, Unsteady flow, Ground water recharge, Aquifers, Computer programs.

Mathematical models were developed for theoretical analysis of the unsteady fluid motion in an unconfined homogeneous, isotropic aquifer subject to local recharge. The models apply to one- and two-dimensional analysis of the flow problems within the saturated zone. Numerical solutions were obtained for the outflow hydrograph and the temporal variation of the free surface for the one-dimensional case. For the two-dimensional analysis, the temporal and spatial variations of flow patterns were also attained. These numerical results were compared with the experimental data from a Hele-Shaw model. (Modified author abstract)

PB-230 424/4GA PC$6.50/MF$1.45
Oklahoma State Univ., Stillwater.
A MULTILAYER AQUIFER MODEL OF THE OGALLALA FORMATION IN OKLAHOMA.
Master's thesis,
Jack Thomas Chowning. Jul 73, 66p W74-05962, OWRR-A-038-OKLA(2)

Descriptors: *Aquifers, *Hydrogeology, Theses, Mathematical models, Oklahoma, Layers, Permeability.
Identifiers: *Ogallala Formation.

The effects of layering on an aquifer were studied to obtain a better definition of the properties of the Ogallala Formation in the panhandle of Oklahoma. Two sand models simulated the conditions found in this area. Laboratory analyses of sand samples from the area were used to give an initial definition of the materials used in the model study. The validity of using a layered approach as opposed to a homogeneous approach in a computer modeling of the aquifer is supported by some of the data obtained. Transmissibilities of layers in combinations are approximated by a summation of the layer transmissibilities.

PB-230 795/7GA PC$25.75/MF$1.45
Iowa State Univ., Ames. Dept. of Earth Sciences.
ALLUVIAL GROUND WATER QUALITY ALTERATION AS RELATED TO SOLID WASTE DISPOSAL SITES IN IOWA. PART I. TEXT. PART II. APPENDIX.
Master's thesis,
Jon Martin Peckenpaugh. 1973, 454p W74-06256, OWRR-A-047-IA(2)

Descriptors: *Solid waste disposal, *Water pollution, *Iowa, Fluid flow, Ground water, Leaching, Hydrology, Seepage, Water quality, Water analysis, Theses, Garbage disposal, Spectrophotometry.
Identifiers: *Sanitary landfills.

The effects solid waste disposal sites in and near Iowa located on alluvial systems have upon groundwater quality were studied at Ames, Des Moines, Mason City, and Omaha. The hydrogeologic study was pursued to satisfy four major objectives. The first was to determine the composition and variations in the composition of groundwater affected by leachate flowing from solid waste disposal sites. The second objective was to determine the shape of the contaminated zone of groundwater and the approximate direction and rate of groundwater flow in the vicinity of the landfills. A third objective was to evaluate the effects that precipitation and variations in stream discharge had upon the static water level, the composition of the groundwater, and groundwater movement in the vicinity of the landfills. The fourth was the development of general cases that could be applied to similar hydrogeologic environments.

PB-230 946/6GA PC$12.00/MF$1.45
Iowa Univ., Iowa City. Dept. of Mechanics and Hydraulics.
EFFECTS OF MEANDERING ON SEDIMENT DISCHARGES AND FRICTION FACTORS OF ALLUVIAL STREAMS.
Doctoral thesis,
Yasuo Onishi. Dec 72, 176p W74-06258, OWRR-A-029-IA(4)

Descriptors: *Channels(Waterways), *Sediment transport, Stream flow, Alluvium, Hydraulic models, Theses.
Identifiers: Meanders.

The effects of channel meandering and of width of sinuous streams on the sediment loads and the friction factors of the flows were studied in flume experiments. Thirteen triplets of experiments were conducted in the subcritical flow domain in one straight and two meandering laboratory channels with sand beds and rigid walls. In each run, measurements were made of water-surface profiles, bed elevations, and total sediment discharge. In addition, detailed measurements of the distributions of the magnitude and direction of the local velocity and of suspended sediment concentration were made in two of the meandering-channel experiments.

PB-230 949/0GA PC$13.00/MF$1.45
Iowa State Univ., Ames. Dept. of Agronomy.
STEADY-STATE FLOW PATTERNS OF RAIN-WATER SEEPING THROUGH BEDDED SOIL WITH AND WITHOUT TILE DRAINS.
Doctoral thesis,
Norris Ledford Powell. 1973, 200p W74-06257, OWRR-A-044-IA(2)

Descriptors: *Soil water, *Subsurface drainage, Steady flow, Tile drains, Saturated soils, Theses, Computer programs, Fluid infiltration.

A modified Gram-Schmidt method was used to obtain the mathematical solution for two boundary value problems of soil water drainage. The flow medium was assumed to be water saturated. Only the steady-state condition was considered. In the first problem the seepage patterns of rainwater flowing through soil were determined. The soil is underlain by an impermeable barrier ata finite depth. A tile drain is half embedded in the impermeable barrier and located directly below furrows in the surface. In the second problem the seepage patterns of rainwater flowing through soil of infinite depth are determined. Water is allowed to stand in the drainage furrows. The solutions were obtained from potential theory by solving Laplace's equation to satisfy an appropriate set of boundary conditons. (Modified author abstract)

PNE-RB-51-6 PC$3.25/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa).
RADIOLOGICAL MONITORING PROGRAM, MAY 17, 1973--JULY 31, 1973.
1973, 21p

Descriptors: (*Rio blanco event, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Tritium, Radiation monitoring), Colorado, Contained explosions, Environment, Milk, Natural radioactivity, Nuclear explosions, Potassium 40, Surface air, Surface waters, Underground explosions.

For abstract, see NSA 29 07, number 15593.

SCPRI(RM)-7-1973 PC$3.00/MF$1.45
Service Central de Protection Contre les Rayonnements Ionisants, 78 - le Vesinet (France).
MONTHLY PROGRESS REPORT.
Jul 73, 15p
In French. U.S. Sales Only.

Descriptors: (*France, *Radiation monitoring), (*Environment, Radiation monitoring), (*Beryllium 7, Radiation monitoring), (*Zirconium 95, Radiation monitoring), Air, Barium 140, Bibliographies, Cattle, Cesium 137, Drinking water, Dusts, Earth atmosphere, Fishes, Food chains, Ground water, Iodine 131, Lanthanum 140, Manganese 54, Milk, Niobium 95, Plants, Radium 226, Rain, Reactor sites, Rhodium 106, Ruthenium 103, Ruthenium 106, Seawater, Strontium 90, Surface waters, Tables, Tritium, Uranium.

For abstract, see NSA 29 07, number 15594.

SCPRI(RM)-7-1973(Suppl.) PC$3.25/MF$1.45
Service Central de Protection Contre les Rayonnements Ionisants, 78 - le Vesinet (France).
APPENDIX TO THE MONTHLY PROGRESS REPORT. DETAILS TO THE RESULTS OF MEASUREMENTS.
Jul 73, 25p
In French. U.S. Sales Only.

Descriptors: (*France, *Radiation monitoring), (*Environment, Radiation monitoring), (*Beryllium 7, Radiation monitoring), (*Zirconium 95, Radiation monitoring), Air, Barium 140, Cattle, Cesium 137, Drinking water, Dusts, Earth atmosphere, Fishes, Food chains, Ground water, Iodine 131, Lanthanum 140, Manganese 54, Milk, Niobium 95, Plants, Radium 226, Rain, Reactor sites, Rhodium 106, Ruthenium 103, Ruthenium 106, Seawater, Strontium 90, Surface waters, Tables, Tritium, Uranium.

For abstract, see NSA 29 07, number 15595.

UCRL-75325 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
GE(LI) LOW LEVEL IN-SITU GAMMA-RAY SPECTROMETER APPLICATIONS.
P. L. Phelps, L. R. Anspaugh, S. J. Roth, G. W. Huckabay, and D. L. Sawyer. 27 Dec 73, 20p
CONF-731112-24

Descriptors: (*Radionuclide migration, *Gamma spectroscopy), (*Soils, Radionuclide migration), Gamma spectrometers, Nevada test site, Radiation monitoring, Radioactive waste disposal, Reactor sites.

For abstract, see NSA 29 07, number 15631.

8I. Mining Engineering

COM-74-10584-06/GA
(Order as COM-74-10584)
State Univ. of New York, Stony Brook. Marine Sciences Research Center.
A REVIEW OF THE PRESENT, AND ANNOUNCED FUTURE, CAPABILITIES FOR COMMERCIAL OIL RECOVERY BEYOND THE 656-FOOT ISOBATH,
L. C. Leopold. 1973, 8p NOAA-74020701-6
Prepared in cooperation with University of Southern California, Los Angeles. Marine Advisory Program.
Included in Marine Affairs Jnl., n1 p91-97, Dec 73.

Descriptors: *Offshore drilling, *Oil recovery, Reviews, Rotary drilling rigs.
Identifiers: Sea Grant program.

This is a brief look at the commitment of the oil industry to deep, offshore exploitation. It is assumed that a significant way to gauge its expectations of deep, greater than 656 feet, recovery is to look at the actual capabilities and the expansion of attendant technologies. There are two portions to this paper. The first is a tabulation inventory of drilling rigs. The inventories for 1969, 1970, 1971, and 1972 are presented in tables 1, 2, 3, and 4, respectively. The second part of the paper is a synthesis of specific reports. Each helps to define what the developed capabilities for, and commitments to, commercial oil recovery at depths greater than 656 feet are.

LA-5459-SR PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RAPID EXCAVATION BY ROCK MELTING. LASL SUBTERRENE PROGRAM, DECEMBER 31, 1972--SEPTEMBER 1, 1973.
R. J. Hanold. Nov 73, 38p
Contract W-7405-eng-36

Descriptors: (*Subterrene penetrators, *Research programs), Excavation, Melting, Rock drilling, Tunnels.

For abstract, see NSA 29 07, number 15475.

PATENT-3 802 091 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF TRACING THE FLOW OF LIQUIDS BY USE OF POST RADIOACTIVATION OF TRACER SUBSTANCES.
Patent,
Frederick E. Armstrong. Filed 3 Nov 58, patented 26 Sep 61, 4p PAT-APPL-771 683, DOCKET/MIN-306
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fluid flow, *Oil wells, *Gas wells, *Isotopic labeling, *Patents, Iodine, Potassium iodides, Neutron irradiation, Soil science.
Identifiers: PAT-CL-250-83, Tracer studies.

This patent relates to a method for determining the flow of fluids through porous media, e.g., earth layers, and tracing their paths therethrough by injecting into a borehole a fluid containing an element, which on neutron irradiation forms a radioisotope, removing the fluid from another borehole spaced from the first, irradiating the effluent fluid with a neutron source, and detecting the radioactivity produced in the added element. In the production of oil and gas, knowledge of the rate of flow of fluids within and through the subsurface media, particularly during stimulative injection of water or gases into a petroleum reservoir, is of great importance.

PATENT-3 116 450 Not available NTIS
Department of the Interior, Washington, D.C.
TRACER LIQUID RELEASE TUBE HAVING FRANGIBLE ELEMENTS AT OPPOSITE ENDS OF THE TUBE.
Patent,
Stanley M. Longwill. Filed 25 Aug 61, patented 31 Dec 63, 3p PAT-APPL-134 057,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Well logging, *Patents, Release mechanisms, Boreholes, Probes, Fluid flow.
Identifiers: PAT-CL-324-2.

The patent concerns a device for selectively placing a tracer liquid in water of a well borehole, and having particular utility in conjunction with the operation of an electric well logging apparatus.

PATENT-3 137 648 Not available NTIS
Department of the Interior, Washington, D.C.
PRETREATMENT OF MINERALS FOR ELECTROSTATIC SEPARATION.
Patent,
Foster Fraas. Filed 24 Jan 62, patented 16 Jun 64, 8p PAT-APPL-168 559, DOCKET/MIN-495
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Beneficiation, Separation, Electrostatic separators, Minerals, Energy levels, Electric discharges.
Identifiers: PAT-CL-209-9.

The patent describes a method whereby minerals are conditioned by treating them in a fluid and by raising the energy level in the fluid to render the minerals therein more amenable to electrostatic separation.

PATENT-3 273 993 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS OF REDUCTION ROASTING OF IRON ORE WITH METALLIC IRON.
Patent,
Norwood B. Melcher. Filed 30 Jan 64, patented 20 Sep 66, 2p PAT-APPL-341 462, DOCKET/MIN-678
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Roasting, *Patents, Beneficiation, Iron ores.
Identifiers: PAT-CL-75-1.

The patent relates to processing off-grade iron ores to produce iron-bearing material suitable for use in blast furnaces or other iron-making devices.

PATENT-3 278 028 Not available NTIS
Department of the Interior, Washington, D.C.
FLOTATION OF MICA.
Patent,
Frank W. Millsaps, and James S. Browning. Filed 31 Oct 63, patented 11 Oct 66, 3p PAT-APPL-320 576,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Flotation, *Mica, *Patents, Froth, Flotation conditioning, Flotation reagents, Pulps.
Identifiers: PAT-CL-209-166.

The patent relates to a conventional froth flotation procedure in which the ore is first ground to relatively fine particles, water is added to form a pulp and the pulp is passed to a flotation cell where reagents are added and air is introduced.

PATENT-3 292 780 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR IMPROVED FLOTATION TREATMENT OF IRON ORES BY SELECTIVE FLOCCULATION.
Patent,
Donald W. Frommer, and Arthur F. Columbo.
Filed 4 May 64, patented 20 Dec 66, 6p PAT-APPL-364 861, DOCKET/MIN-667
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Flotation, *Iron ores, Patents, Flocculating, Wet classifiers, Silicon dioxide.
Identifiers: PAT-CL-209-5.

The patent relates to a method for removal of slimed silica to enable effective use of flotation processes on the deslimed residue.

PB-228 623/5GA PC$3.25/MF$1.45
Bureau of Mines, Washington, D.C.
MINE ROOF VIBRATIONS FROM UNDERGROUND BLASTS, PILOT KNOB, MO.
Report of Investigations,
David E. Siskind, James J. Snodgrass, Richard A. Dick, and John N. Quiring. Jan 74, 26p BuMines-RI-7764
Prepared by Twin Cities Mining Research Center, Minn.

Descriptors: *Mining engineering, *Blasting, Vibration, Underground mining, Roofs, Rock mechanics, Propagation.

The Bureau of Mines recorded particle accelerations in the mine roof produced by three types of explosives in the Pilot Knob Pellet Co. mine, Pilot Knob, Mo. Examined were the effectiveness of cube root, square root, and two-thirds power scaling in grouping the underground blast vibration data, and the effects of mine gemoetry, rock type, explosive type, and charge size on blast vibration levels. The vibrations from the Pilot Knob blasts were best grouped by a square root scaling factor. The empirical propagation equation A(W to the 1/2 power) = 76,250 R/(Wto the 1/2 power) to the minus 2.61 power where A is the peak acceleration in g's, W is the charge weight in pounds, and R is the distance from the blast in feet, may be used to describe vibration amplitudes from charges fired with zero delay caps, or with a single cap at Pilot Knob. (Modified author abstract)

PB-228 667/2GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
HAZARD FROM ENGINES REBREATHING EXHAUST IN CONFINED SPACE.
Rept. of Investigations,
W. F. Marshall, and R. W. Hurn. Jan 74, 22p BuMines-RI-7757
Prepared by Bartlesville Energy Research Center, Okla.

Descriptors: *Atmosphere contamination control, *Exhaust gases, *Diesel engines, *Mines(Excavations), *Hazards, Carbon monoxide, Mine cars, Nitrogen oxides, Carbon dioxide, Combustion products, Ventillation, Underground mining, Interal combustion engines.

Diesel engines have been used in underground mines and other confined spaces for sometime and their usage is increasing. Diesels have been chosen over gasoline engines because of the (normally) extremely low level of carbon monoxide in diesel exhaust. However, diesels do produce significant quantities of other toxicants; nitric oxides, nitrogen dioxide, and carbon dioxide. More importantly, there are conditions under which diesels can produce significant quantities of CO--the toxicant of primary concern with respect to immediate danger of life. The conditions most likely to occur which cause high CO levels from diesels are those associated with engines rebreathing their exhaust. A series of experiments was conducted at the BERC to determine the influence of exhaust rebreathing on emissions from various gasoline and diesel engines. Tests were conducted which simulated operation of engines in nonventilated spaces as well as in spaces with partially restricted ventilation. Results of these tests showed that exhaust rebreathing can have a marked effect on exhaust emissions and thus on the composition of the air in the working space. (Author)

PB-230 447/5GA PC$17.50/MF$1.45
Naval Ammunition Depot, Crane, Ind.
DEVELOPMENT OF MINIMUM LUMINANCE REQUIREMENTS FOR UNDERGROUND COAL MINING TASKS.
Final rept.,
Lyman C. Hitchcock. 31 Jan 73, 289p NAD-RDTR-216 BuMines-OFR-12-74
Contract H0111969

Descriptors: *Coal mining, *Mine lighting, Standards, Underground mining, Reflectivity, Job analysis, Luminance, Visibility, Safety engineering.

This report develops minimum luminance levels for tasks in work spaces in by the last open crosscut and first transfer point in conventional, continuous, and longwall coal mining operations. Minimum luminance levels were determined for the three types of operations. Visual tasks coupled with associated reflectivity information were determined for the jobs in 12 mining sections. These data were transferred to fullscale models of mining machinery and simulated mine work space where minimum luminance levels were determined by an accepted method of evaluating visual performance in different luminous environments.

PB-230 687/4GA
Mag Tape $97.50;Foreign $122.50
Geological Survey, Denver, Colo.
OIL SHALE FISCHER ASSAY DATA FOR COREHOLES IN THE PICEANCE CREEK BASIN, COLORADO.
Final rept.,
J. K. Pitman. 1974, 1 reel mag tape USGS-GD-74-006
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Magnetic tapes, *Oil shale, *Chemical analysis, Piceance Creek Basin, Colorado, Cores.

The magnetic tape consists of oil shale Fischer assay data as determined by the U.S. Bureau of Mines, Laramie, Wyoming, for core holes in the Piceance Creek basin, Colorado. A supplementary tape of similar data for Utah and Wyoming will be released at a later date. These tapes serve as a data base for the Oil-Shale Data Analysis Program and the Bargraph Program designed by the Geological Survey. (Author)

PB-230 775/9GA PC$4.75/MF$1.45
Kentucky Univ., Lexington. Coll. of Engineering.
THE LIMITS TO KENTUCKY COAL OUTPUT: A SHORT-TERM ANALYSIS.
Annual rept.
Stuart A. Schweitzer. Feb 74, 31p UKY-TR81-74-IMMR2

Descriptors: *Kentucky, *Coal, *Economic analysis, Production capacity, Regulations, Rail transportation.

While the demand for Kentucky coal and market prices have increased dramatically in recent months, the capacity of the Kentucky coal industry to increase its output is seriously limited in the near term. This report attempts to identify current coal industry problems which may influence the level of coal output in the next year or two and to estimate by how much Kentucky coal output may be expected to rise during that period. The analysis for this report is based upon conversations with coal industry spokesmen as well as with representatives of state government and the coal-hauling railroads.

PB-230 961/5GA PC$13.50/MF$1.45
Geological Survey, Denver, Colo.
AVERAGE OIL YIELD TABLES FOR OIL-SHALE SEQUENCES IN CORE FROM THE NORTHERN PART (TPS. 1N-2S) OF THE PICEANCE CREEK BASIN, COLORADO, THAT AVERAGE 15, 20, 25, 30, 35, AND 40 GALLONS PER TON.
Final rept.,
J. K. Pitman, and J. R. Donnell. 1974, 208p USGS-GD-74-003
See also PB-230 962.
Paper copy also available from NTIS $62.25/set of 3 reports as PB-230 960-SET.

Descriptors: *Oil shale, *Piceance Creek Basin, *Cores, Colorado, Data, Yield, Shale oil.

This report consists of data, arranged by township, range, and section, for well cores drilled in the northern part of the Piceance Creek basin, Colorado. An additional two reports contain data for wells drilled in the central (Tps. 3S-4S) and southern (Tps. 5S-11S) parts of the basin.

PB-230 962/3GA PC$24.75/MF$1.45
Geological Survey, Denver, Colo.
AVERAGE OIL YIELD TABLES FOR OIL-SHALE SEQUENCES IN CORE FROM THE CENTRAL PART (TPS. 3S-4S) OF THE PICEANCE CREEK BASIN, COLORADO, THAT AVERAGE 15, 20, 25, 30, 35, AND 40 GALLONS PER TON.
Final rept.,
J. K. Pitman, and J. R. Donnell. 1974, 432p USGS-GD-74-004
See also PB-230 963.
Paper copy also available from NTIS $62.25/set of 3 reports as PB-230 960-SET.

Descriptors: *Oil shale, *Piceance Creek Basin, *Cores, Colorado, Data, Yield, Shale oil.

This report consists of data, arranged by township, range, and section, for well cores drilled in the central part of the Piceance Creek basin, Colorado. An additional two reports contain data for wells drilled in the northern (Tps. 1N-2S) and southern (Tps. 5S-11S) parts of the basin.

PB-230 963/1GA PC$26.50/MF$1.45
Geological Survey, Denver, Colo.
AVERAGE OIL YIELD TABLES FOR OIL-SHALE SEQUENCES IN CORE FROM THE SOUTHERN PART (TPS. 5S-11S) OF THE PICEANCE CREEK BASIN, COLORADO, THAT AVERAGE 15, 20, 25, 30, 35, AND 40 GALLONS PER TON.
Final rept.,
J. K. Pitman, and J. R. Donnell. 1974, 468p USGS-GD-74-005
See also PB-230 961.
Paper copy also available from NTIS $62.25/set of 3 reports as PB-230 960-SET.

Descriptors: *Oil shale, *Piceance Creek Basin, *Cores, Colorado, Data, Yield, Shale oil.

This report consists of data, arranged by township, range, and section, for well cores drilled in the southern part of the Piceance Creek basin, Colorado. An additional two reports contain data for wells drilled in the central (Tps. 3S-4S) and northern (Tps. 1N-2S) parts of the basin.

PB-230 972/2GA PC$15.00/MF$1.45
West Virginia Univ., Morgantown. Engineering Experiment Station.
STATISTICAL EVALUATION AND MITIGATION OF INDUCTIVE INTERFERENCE PROBLEMS IN PORTABLE POWER CABLES.
29 Jun 73, 237p BuMines-OFR-14-74
Contract G0122088

Descriptors: *Safety, *Electric cables, Mines(Excavation), Electrical grounding, Electricity, Hazards, Reduction, Suppressors, Mathematical analysis.

The report provides analysis of Bureau of Mines data on induced voltages and currents in portable trailing cables and their influence on ignition hazard. Effect of cable configuration and length are considered under worst-case electrical load conditions. The advantage to be gained by installation of diode bridges is quantitatively described, and a guide that eliminates the need for some physical measurement is included.

8J. Physical Oceanography

AD-776 491/3GA Reprint
Naval Oceanographic Office Washington D C
CONTRIBUTION A L'ETUDE DES FONDS DE LA MER DE LA SCOTIA ET DE SES ABORDS (ATLANTIQUE AUSTRAL) (CONTRIBUTION TO THE STUDY OF THE BOTTOM OF THE SCOTIA SEA AND ITS BORDERING STRUCTURES (THE AUSTRAL ATLANTIC.)),
J. R. Vanney, L. Dangeard, and G. L. Johnson. 13 Jul 72, 29p
Text in French; summary in English.
Availability: Pub. in Revue de Geographie Physique et de Geologie Dynamique, v14 n5 p465-484 1972.

Descriptors: *South Atlantic Ocean, *Ocean bottom, *Geomorphology, Underwater photography.

The Scotia Sea is a youthful marginal sea, the formation of which has created three prime geomorphological units: (1) the bordering structures represented by the marginal Plateau of the Malouines or 'Falklands' and the South Sandwich Island Trench; (2) the Scotia Arc consisting primarily of continental fragments which have been progressively pulled apart and sheared by the Austral Atlantic fracture zones. (3) finally, the central basins Drake Passage and eastern Basin with their separating sub-meridian ridge, and to the southwest the South Orkney Trench. The analysis of the many photographs taken in the course of four USNS ELTANIN missions provided the opportunity to define several aspects of the submarine morphology. Extrusions of pillow-lavas, glacio-marine deposits reflecting the action of drift ice, deep bottom currents originating along the fringes of the Antarctic continent, and the activity of benthic organisms are evident in the bottom photographs. (Modified author abstract)

AD-776 876/5GA Reprint
Woods Hole Oceanographic Institution Mass
PEAK HEIGHT VERSUS PEAK INTENSITY ANALYSIS OF X-RAY DIFFRACTION DATA.
Technical rept.,
John D. Milliman, and Brian D. Bornhold. 26 Apr 73, 7p Rept nos. WHOI-74-15, WHOI-Contrib-3090
Contract N00014-66-C-0241
Availability: Pub. in Sedimentology, v20 p445-448 1973.

Descriptors: *X ray diffraction, *Sediments, *Carbonates, Ocean bottom, Calcite, Aragonite.

The quantification of calcite and aragonite content within a carbonate sediment is markedly more accurate when one uses peak-area analysis. Peak-height intensity is dependent upon several factors which minimizes its use in quantification. (Author)

AD-776 877/3GA Reprint
Woods Hole Oceanographic Institution Mass
RELICT CARBONATE-RICH SEDIMENTS ON SOUTHWESTERN GRAND BANK, NEWFOUNDLAND.
Technical rept.,
John D. Milliman, and Jens Mueller. 13 Aug 73, 11p Rept nos. WHOI-74-14, WHOI-Contrib-3129
Contracts N00014-66-C-0241, DI-14-08-0001-10875
Revision of report dated 20 Jun 73. Prepared in cooperation with Technische Universitat, Muenchen (West Germany). Institut fuer Geologie.
Availability: Pub. in Canadian Jnl. of Earth Sciences, v10 p1744-1750 1973.

Descriptors: *Sediments, *North Atlantic Ocean, Newfoundland(Province), Carbonate minerals, Sedimentation, Petrology, Ocean bottom.
Identifiers: Grand Bank.

The paper deals with the nature and origin of the carbonate-rich sediments on the southwestern part of Grand Bank off Newfoundland, Canada. This occurrence is particularly anomalous in light of the carbonate-poor sediments that occur in the warmer waters to the south and in light of the previously proposed late Quaternary history of the area.

AD-777 052/2GA PC$3.25/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
SHORT-TERM ENGINEERING BEHAVIOR OF A DEEP-SEA CALCAREOUS SEDIMENT.
Technical note,
P. J. Valent. Mar 74, 38p Rept no. NCEL-TN-1334

Descriptors: *Ocean bottom soils, *Sediments, *Soil mechanics, Foraminifera, Calcium compounds, Carbonates, Grain size, Creep, Stresses, Compressive properties.
Identifiers: Calcium carbonates, Globigerina.

The engineering index parameters, primary consolidation properties, and effective-stress strength properties of a deep-sea calcareous sediment are reported. This short-term engineering property description of the sediment is the first stage of an in-depth study of creep behavior of this sediment during consolidation and shear. The calcareous sediment sample has been classified as an inorganic silt, according to the Unified Soil Classification System. The compression index C(c), is 0.80; empirical correlations from terrestrial engineering between C(c) and other, easily and rapidly-measured index parameters may be in error by 30%. The effective angle of internal friction, phi, of the sediment, when normally consolidated, is 0.65 radians (37 degrees). No significant crushing of the hollow Foraminifera tests (shells) comprising the coarse-size fraction of the sediment was noted in the consolidation tests up to stresses of 1530 kPa (32,000 psf). It was demonstrated, however, that this coarse-size fraction does undergo significant crushing if the material finer than 0.043 millimeter is removed, suggesting that the fine-size fraction acts to distribute load on the coarse-size, test (shell) surfaces. (Author)

COM-74-10599/0GA PC$3.00/MF$1.45
Alaska Univ., Anchorage.
A REPORT ON THE UNIVERSITY OF ALASKA SEA GRANT PROGRAM FOR 1971-1972,
David M. Hickok. Jun 73, 18p Alaska-SG-Pub-73-8 NOAA-74021306

Descriptors: *Alaska, *Coasts, *Research projects, Technical reports, Natural resources.
Identifiers: Sea Grant program.

This report summarizes and highlights the accomplishments and problems of the Alaska Sea Grant Program during the period May 1971 through October, 1972. Subject areas dealth with are expressed as: understanding our coastal zone, developing our marine resources, investigating our frozen seas, relating information to our people, and financing our program.

COM-74-10604/8GA PC$3.00/MF$1.45
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
UNIVERSITY OF CALIFORNIA SEA GRANT COLLEGE PROGRAM DIRECTORY 1973-1974.
1974, 20p IMR-74-6, Sea Grant Pub-28 NOAA-74021323
Grant NOAA-043-122

Descriptors: *Oceanographic data, Directories, Indexes(Documentation), Education, Management, Coasts, Fisheries, Aquaculture, Project planning.
Identifiers: Sea Grant program.

The program directory (1973 - 1974) provides a listing of current projects and their objectives in the following categories: management, education and advisory services, coastal zone studies, fisheries and aquaculture, marine products research, and ocean engineering research.

COM-74-10607/1GA PC$10.00/MF$1.45
National Marine Fisheries Service, Washington, D.C. Atlantic Environmental Group.
EXPENDABLE BATHYTHERMOGRAPH OBSERVATIONS FROM THE NMFS/MARAD SHIP OF OPPORTUNITY PROGRAM FOR 1971.
Data rept. no. 81,
Steven K. Cook. Nov 73, 140p NOAA-NMFS-DR-81 NOAA-74022030

Descriptors: *Oceanographic data, *Bathythermograph data, *Atlantic Ocean, Temperature, Salinity, Data processing, Mexico Gulf, Caribbean Sea.

Results of the first year of operation of the NMFS/MARAD Ship of Opportunity Program in the form of horizontal and vertical distributions of temperature are presented. Operational procedures and problems and data managment also are discussed. Ship routes were selected to obtain regular sampling in the most dynamic areas of the Gulf of Mexico, Caribbean Sea and western tropical Atlantic Ocean; namely, the Yucatan Straits, Straits of Florida, and the Antilles, Equatorial, and Guiana Currents. Repeated coverage is important for comparative analysis, so ships with the most regular schedules were chosen.

JPRS-61542 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
SEA SURFACE ENERGY AND TEMPERATURE ANALYSIS,
I. T. Razumovskii, and A. D. Rozenberg. 21 Mar 74, 11p
Trans. of Akademiya Nauk SSSR. Izveatiya. Fizida Atmosfery i Okeana, v9 n12 p1318-1326 1973.

Descriptors: *Oceans, *Surface temperature, *Sea states, *Spectrum analysis, Solar radiation, Ocean waves, Electromagnetic scattering, USSR, Translations.

Contents:
- Reducing the effect of sky radiation during measurement of water surface temperature with radiation thermometer;
- Determining the energy-carrying part of the sea wave spectrum according to the phase characteristics of a radio signal scattered by the sea.

N74-17115/8GA PC$5.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OCEAN COLOR SPECTRUM CALCULATIONS.
W. R. Mcchuney. Feb 74, 39p NASA-TM-X-70594, X-913-74-53
Subm-Submitted for Publication.

Descriptors: *Color, *Ocean models, *Spectral emission, Ocean bottom, Radiative heat transfer, Refractivity, Remote sensors, Scattering functions.

For abstract, see STAR 1208

PB-229 895/8GA PC$3.75/MF$1.45
Woods Hole Oceanorgaphic Institution, Mass.
SUSPENDED MATTER AND OTHER PROPERTIES OF SURFACE WATERS OF THE NORTHEASTERN ATLANTIC OCEAN.
Technical rept.,
K. O. Emery, Fred Lepple, Lois Toner, Elazar Uchupi, and R. H. Rioux. Mar 74, 61p WHOI-74-17, WHOI-Contrib-3296
Grant NSF-GX-28193
Prepared in cooperation with Delaware Univ., Newark and Natal Univ., Durban (South Africa).

Descriptors: *Oceanographic surveys, *North Atlantic Ocean, *Suspended sediments, Wind(Meteorology), Temperature, Salinity, Color, Organic compounds, Upwelling.

Samples of suspended matter were collected at 1534 stations off the west coast of Africa during two geophysical cruises of 1972 and 1973. Many correlations exist with respect to auxiliary measurements of winds, temperature, salinity, currents, chlorophyll, phytoplankton, zooplankton-nekton, dustfall, and proximity to major river mouths. Some of the relationships can be expressed in terms of oceanic zones. (Modified author abstract)

PB-231 009/2GA PC$5.25/MF$1.45
Washington Univ., Seattle. Div. of Marine Resources.
PILOT STUDY NARRATIVES, 1971.
May 71, 41p AIDJEX-Bull-8, AIDJEX-71-8
Contract NSF-C625
See also PB-228 788.

Descriptors: *Oceanographic surveys, *Beaufort Sea, Reviews, Sea ice, Pack ice, Ocean currents, Remote sensing, Air water interactions.

During March and April of 1971 coordinated AIDJEX pilot studies were conducted in the Beaufort Sea. AIDJEX Bulletin No. 8 contains narratives describing how these studies were carried out. The following studies were conducted: a combined CRREL-USGS-NASA program of complementary remote sensing overflights and ground truth investigations; a study of ocean currents, conducted by the Lamont-Doherty Geological Observatory of Columbia University; a program of oceanographic measurements, conducted by the University of Washington Department of Oceanography; and an air-ice boundary layer study, conducted by the Arctic Submarine Lab of the Naval Undersea Center. A report on the logistics of the pilot study is also included.

8K. Seismology

AD-776 672/8GA PC$3.25/MF$1.45
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
REGIONAL ATTENUATION OF SHORT-PERIOD P AND S WAVES IN THE UNITED STATES.
Technical rept.,
Zoltan A. Der, Robert P. Masse, and John P. Gurski. 22 Jan 74, 47p Rept no. SDAC-TR-74-1
Contract F08606-74-C-0006, ARPA Order-1620

Descriptors: *Seismic waves, *Underground explosions, *Seismic detection, Earthquakes, Attenuation, United States, Nuclear explosions.
Identifiers: Vela Uniform.

Regional distribution of anelastic attenuation beneath the United States was investigated using amplitudes and dominant periods of short period P and S waves originating from deep focus earthquakes in South America and the Circumpacific seismic belt, recorded at LRSM (Long Range Seismic Measurement) stations. The observed regional distribution pattern shows high attenuation in the western United States, including California, and a less pronounced high attenuation region in the northeastern United States. This distribution pattern is similar to that reported by Solomon and Toksoz (1970) for long period S waves, but differs from it sufficiently to indicate lateral variations in the frequency dependence of the average crust-upper mantle attenuation across the United States. The relative changes of short period P and S wave amplitudes can be sufficiently explained by assuming a complex shear modulus, no losses in compression are indicated. (Author)

COM-74-10591/7GA PC$4.00/MF$1.45
Utah Univ., Salt Lake City. Dept. of Geological and Geophysical Sciences.
SEISMICITY AND CONTEMPORARY TECTONICS OF THE YELLOWSTONE PARK-HEBGEN LAKE REGION.
Final rept., 1 Jul 72-30 May 73,
Robert B. Smith, and Alan B. Trimble. 30 May 73, 76p NOAA-74021322
Grant NOAA-043-022-13

Descriptors: *Tectonics, *Rocky Mountains, *Seismology, Hebgen Lake, Earthquakes, Idaho, Wyoming, Geological faults.
Identifiers: Yellowstone Park.

In order to relate the seismic activity of the Yellowstone Park Hebgen Lake area to the regional tectonics, detailed microearthquake monitoring was undertaken during the summer of 1972 to identify the local seismic patterns, and to determine the local stress distribution from fault plane solutions. Also a study of the possible correlation of earthquake swarms to geothermal features was conducted in the Norris Geyser Basin and in the Upper and Lower Geyser Basins.

COM-74-10685/7GA PC$8.75/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
UNITED STATES EARTHQUAKES - 1957,
Rutlage J. Brazee, and William K. Cloud. 1959, 113p

Descriptors: *Earthquakes, *United States, Epicenters, Seismic waves, Intensity, Maps, Tables(Data).

The publication is a summary of earthquake activity in the United States and regions under its jurisdiction for the calendar year 1957.

COM-74-10711/1GA PC$8.00/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
UNITED STATES EARTHQUAKES - 1965,
Carl A. von Hake, and William K. Cloud. 1967, 96p NOAA-74030413

Descriptors: *Earthquakes, *United States, Statistical data, Maps, Seismic epicenter, Water wells, Tides.

The publication is a summary of earthquake activity in the United States and regions under its jurisdiction for the calendar year 1965. Data are given also on geodetic work of seismological interest, tidal disturbances of seismic origin, tilt information, flutuations in well-water levels, seismological observatories, principal earthquakes of the World during 1965 and strong-motion seismograph results.

COM-74-10712/9GA PC$9.25/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
UNITED STATES EARTHQUAKES - 1966,
Carl A. von Hake, and William K. Cloud. 1968, 123p NOAA-74030414

Descriptors: *Earthquakes, *United States, Statistical data, Maps, Seismic epicenter, Water wells, Tides.

The publication is a summary of earthquake activity in the United States and regions under its jurisdiction for the calendar year 1966. Data are given also on geodetic work of seismological interest, tidal disturbances of seismic origin, tilt information, fluctuations in well-water levels, seismological observatories, principal earthquakes of the World during 1966 and strong-motion seismograph results.

COM-74-10714/5GA PC$8.25/MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
CATALOG OF STRONG-MOTION SEISMOGRAPH STATIONS AND RECORDS,
Rutlage J. Brazee. 1974, 102p NOAA-74022603
Key to Geophysical Records Documentation no. 2.

Descriptors: *Seismological stations, *United States, *Central America, *South America, Maps, Tables(Data), Accelerometers, Seismographs.

The catalog lists all strong-motion accelerographs which are part of the National Strong-Motion Instrumentation Network managed by Seismic Engineering, USGS, for the National Science Foundation. The National Strong-Motion Instrumentation Network consists of instruments belonging to federal, state, and local agencies and private organizations. It contains dates and times of all seismograms recorded and an indication of the forms in which copies are available from the archives of EDS. The catalog is arranged by major geographic area--North, Central, and South America. Within each area, the next subdivision is alphabetical by state or country. The individual instrument sites are then listed alphabetically by city or other recognizable designation. A geographic index of locations of instrument sites, by city, is contained in the maps reprinted from Perez and Schwartz, 1973.

COM-74-10777/2GA PC$7.75/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
UNITED STATES EARTHQUAKES - 1967,
Carl A von Hake, and William K. Cloud. 1969, 93p NOAA-74030415

Descriptors: *Earthquakes, *United States, Statistical data, Maps, Seismic epicenter, Water wells, Tides.

The publication is a summary of earthquake activity in the United States and regions under its jurisdiction for the calendar year 1967. Data are given also on geodetic work of seismological interest, tidal disturbances of seismic origin, tilt information, fluctuations in well-water levels, seismological observatories, principal earthquakes of the World during 1967 and strong-motion seismograph results.

COM-74-10778/0GA PC$8.75/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
UNITED STATES EARTHQUAKES - 1968,
Jerry L. Coffman, and William K. Cloud. 1970, 114p NOAA-74030416

Descriptors: *Earthquakes, *United States, Statistical data, Maps, Seismic epicenter, Water wells, Tides.

The publication is a summary of earthquake activity in the United States and regions under its jurisdiction for the calendar year 1968. Data are given also on geodetic work of seismological interest, tidal distrubances of seismic origin, tilt information, fluctuations in well-water levels, seismological observatories, principal earthquakes of the World during 1968 and strong-motion seismograph results.

8L. Snow, Ice, and Permafrost

AD-776 946/6GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
ISUA, GREENLAND: GLACIOLOGICAL INVESTIGATIONS DURING 1973.
Research rept.,

Samuel C. Colbeck, and Anthony J. Gow. Mar 74, 18p Rept no. CRREL-RR-318

Descriptors: *Glaciers, *Greenland, Petrography, Temperature, Land ice.
Identifiers: Isua(Greenland).

Two holes were drilled through the Greenland ice sheet during 1973 and temperature measurements were made in one hole drilled during 1972. These measurements show that the area of liquid water beneath the ice cap extends to ice depths as shallow as 100 m. The consequences of removing the frozen margin of glacial ice could be serious and more temperature measurements are needed to exactly locate the subglacial water. Petrographic studies of a few ice cores revealed a strongly oriented crystal fabric and an appreciable surface accumulation of superimposed ice. (Author)

E74-10400 PC$7.00/MF$1.45
Environmental Research and Technology, Inc., Lexington, Mass.
THE APPLICATION OF ERTS IMAGERY TO MAPPING SNOW COVER IN THE WESTERN UNITED STATES.
Final rept. 28 Jun 72-31 Dec 73,
James C. Barnes, Clinton J. Bowley, and David A. Simmes. Jan 74, 80p ERT-P-407-F NASA-CR-137223
Contract NAS5-21803
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198.

Descriptors: Photomapping, Snow cover, Water resources, Arizona, Sierra Nevada Mountains(CA), Earth resources program, Hydrology, Water runoff, Drainage patterns.

The author has identified the following significant results. In much of the western United States a large part of the utilized water comes from accumulated mountain snowpacks; thus, accurate measurements of snow distributions are required for input to streamflow prediction models. The application of ERTS-1 imagery for mapping snow has been evaluated for two geographic areas, the Salt-Verde watershed in central Arizona and the southern Sierra Nevada in California. Techniques have been developed to identify snow and to differentiate between snow and cloud. The snow extent for these two drainage areas has been mapped from the MSS-5 (0.6 - 0.7 microns) imagery and compared with aerial survey snow charts, aircraft photography, and ground-based snow measurements. The results indicate that ERTS imagery has substantial practical applications for snow mapping. Snow extent can be mapped from ERTS-1 imagery in more detail than is depicted on aerial survey snow charts. Moreover, in Arizona and southern California cloud obscuration does not appear to be a serious deterrent to the use of satellite data for snow survey. The costs involved in deriving snow maps from ERTS-1 imagery appear to be very reasonable in comparison with existing data collection methods.

8M. Soil Mechanics

AD-777 051/4GA PC$3.25/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
SOIL MECHANICS AND THE ADVANCED COMPUTER CODES.
Technical note,
J. B. Forrest. Apr 74, 34p Rept no. NCEL-TN-1324

Descriptors: *Soil mechanics, *Computer programming, Elastic properties, Plastic properties, Mathematical models.
Identifiers: Sanguine project.

The report discusses some of the more complex Soil Models available for input to advanced computer codes. It provides a brief overview of the impact of recent computer code advances upon development within the field of soil mechanics. Two different types of models are discussed: (1) Variable Moduli Models based upon incremental elasticity (2) Elastic-plastic models in which plastic yielding conditions are superimposed upon elastic behavior. The difficulties involved in using experimental data to fit a soil model are considered briefly and the major requirements for acceptable soil constitutive model are presented. The report concludes that the most fruitful avenue of pursuit for future soil-structure interaction studies will involve a versatile form of the variable moduli model. (Author)

8N. Terrestrial Magnetism

AD-776 700/7GA Reprint
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
COMMENTS ON PAPER BY G. R. SCHIMKE AND C. G. BUFE, 'GEOPHYSICAL DESCRIPTION OF A PACIFIC OCEAN SEAMOUNT',
Jean Francheteau, J. G. Sclater, M. L. Richards, and C. G. A. Harrison. 22 May 68, 4p
Contract Nonr-2216(05)
Prepared in cooperation with Miami Univ., Fla. Inst. of Marine Sciences. Rept. no. Contrib-972. Sponsored in part by Contract Nonr-4008(02) and Grant NSF-GA-984. Revision of report dated 28 Feb 68.
Availability: Pub. in Jnl. of Geophysical Research, v73 n24 p7713-7715, 15 Dec 68.

Descriptors: *Geomagnetism, *Pacific Ocean, *Seamounts, Magnetic anomalies.
Identifiers: Paleomagnetism.

In their paper, Schimke and Bufe (1968) analyze extensive bathymetric, magnetic, and gravity data obtained in the course of an excellent survey conducted over the previously uncharted Chautauqua seamount. The precision in the navigation of plus or minus 400 meters enabled them to get a very detailed picture of the geophysical elements of this seamount. The authors purpose in writing this letter is to comment upon the validity of the magnetic interpretation.

N74-17117/4GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ERROR ENHANCEMENT IN GEOMAGNETIC MODELS DERIVED FROM SCALAR DATA.
D. P. Stern, and J. H. Bredekamp. Feb 74, 25p
NASA-TM-X-70592, X-602-74-45
Subm-Submitted for Publication.

Descriptors: *Geomagnetism, *Scalars, *Spherical harmonics, Mathematical models, Recursive functions, Sequencing.

For abstract, see STAR 1208

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-776 352/7GA PC$6.25/MF$1.45
Varian Associates Beverly Mass Bomac Div
LIFE TEST PROGRAM FOR INTERNALLY HEATED CATHODE FOR BL-234C MAGNETRON.
Final rept.,
A. Eklund. Jan 68, 63p
Contract DAAG39-67-C-0010

Descriptors: *Magnetrons, *Cathodes(Electron tubes), Life expectancy, Radiofrequency power, Tungsten, Electron tube heaters, Life tests.

Investigation performed on internally heated tungsten dispenser cathodes during a Production Engineering Measures program on the low field, 70 GHz, BL-234C pulsed magnetron showed promise of longer life (greater than 200 hours) and higher output power performance at one third the heater power of the conventionally designed tube. This program investigated the BL-234C through several cathode structure design changes that are herein discussed. Both physical and electrical problems with the cathode structure that included fracturing of the cathode support stem at several weak areas and deterioration in the output power over short periods of time. One tube passed 160 hours of RF life testing, and four tubes produced in excess of 800 watts output power during some period of RF investigation. (Author)

AD-776 383/2GA PC$4.00/MF$1.45
Hughes Aircraft Co Carlsbad Calif Industrial Products Div
STORAGE CAMERA TUBE WITH NON-DESTRUCTIVE READOUT.
Quarterly progress rept. no. 2, 1 Oct-31 Dec 73,
L. S. Yaggy. Mar 74, 18p ECOM-0330-2-73
Contract DAAB07-73-C-0330
See also AD-774 830.

Descriptors: *Camera tubes, Storage tubes, Electron guns, Arrays, Semiconductor devices, Silicon, Semiconductor diodes, Infrared equipment, Television cameras, Electron tube targets.

The report describes the progress to develop a novel camera-tube capable of dual-mode operation, either as a real-time television camera-tube or as a storage camera-tube with non-destructive readout, switchable upon command. Mode-switching was accomplished successfully on the first complete device, and measurements of sensitivity at 1.06 micrometer wavelength on the second complete device essentially confirmed the original prediction. Separate electron-gun tests continued and have led to a tentative gun design which is expected to be consistent with program goals for resolution and storage-time with reduced raster-size while zooming. Photomasks were designed and ordered to provide for higher diode-array density and, hence, higher target-resolution. (Author)

AD-776 737/9GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
COAXIAL MAIN-LINE CABLES OF TYPE 2.6/9.4.
28 Feb 74, 15p Rept no. FTD-HT-23-1349-74
Edited trans. of Russian State Standard GOST 10971-64 p1-10 1964, by Charles T. Ostertag, Jr.

Descriptors: *Coaxial cables, Multichannel communications, Multiplexing, Standards, Translations, USSR.

The standard extends to main-line coaxial cables with four coaxial pairs and five service quads which are intended for multichannel communication and television with a multiplexing up to 10 mHz. Working voltage of the coaxial pairs should not exceed 1000 V alternating current with a frequency of 40 Hz in the case of electrical strength of the coaxial pairs on mounted repeater sectors of 3000 V direct current for 2 min. Temporary surges of coaxial pairs up to 1400 V with a duration of no more than 1.2 s are permitted. The working voltage of the service quads should not exceed 250 V with a frequency of 50 Hz or 350 V direct current.

AD-776 885/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
COAXIAL MAIN-LINE CABLES TYPE 2.6/9.4.
1 Mar 74, 24p Rept no. FTD-HT-23-1350-74
Edited trans. of Russian State Standard GOST 10971-71, p1-14 1971, by Charles T. Ostertag, Jr.

Descriptors: *Coaxial cables, USSR, Standards, Translations.

The present standard extends to coaxial main-line cables in lead sheathing with four coaxial pairs and five symmetric quads which are intended for multichannel communications and television with multiplexing in the frequency range up to 17 MHz.

AD-776 913/6GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
STUDY OF TRANSIENT RADIATION EFFECTS ON A MONOLITHIC INTEGRATED OPERATIONAL AMPLIFIER CIRCUIT.
Technical rept.,
H. Schauer, and P. Hudson. Mar 74, 32p Rept no. ECOM-4206

Descriptors: *Power amplifiers, *Integrated circuits, *Transient radiation effects, Failure(Electronics), Neutron reactions, Gamma rays, Test methods.
Identifiers: Cobalt 60, Operational amplifiers.

The microAmp 776 micropower operational amplifier was irradiated in Cobalt-60, linear accelerator and fast burst reactor environments. The rest procedures used, the test results obtained, and an analysis of the radition induced failures are presented. Offset voltage increased 25% at 5600 rads (Si) Co60 exposure and up to 400% at 1 X 10 to the 5th power rads (Si) linac exposure. Open loop gain was degraded up to 70% at 6 X 10 to the 4th power rads (Si). Offset voltage approximately doubled at 4 X 10 to the 11th power n/cm (E > or = 10 keV), which is more significant at lower set currents where offset voltages are initially higher. Open loop gain decreased by up to 80% at 5 X 10 to the 11th power n/sq cm, largely due to decreased transistor current gain and partly due to a 30% reduction in quiescent current. (Author)

AD-776 919/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PULSE-PHASE MULTISTABLE ELEMENT AND PROBLEMS OF MICROMINIATURIZATION,
N. Z. Goncharuk, V. I. Zubchuk, and V. A. Karpenko. 25 Mar 74, 10p Rept no. FTD-HT-23-1011-74
Edited trans. of mono. Mnogoustoichivye Elementy i ikh Primenenie. Sbornik Statei, n.p., 1971 p119-123, by Charles T. Ostertag, Jr.

Descriptors: *Semiconductor devices, *Microelectronics, *Relaxation oscillators, Translations, USSR.

AD-776 920/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
USING THE PRINCIPLE OF OPTO-ELECTRONIC CONVERSION FOR MANUFACTURING CERTAIN DYNAMIC MULTISTABLE ELEMENTS,
A. M. Sharadkin, and P. F. Oleksenko. 25 Mar 74, 9p Rept no. FTD-HT-23-1016-74
Edited trans. of mono. Mnogoustoichivye Elementy i ikh Primenenie. Sbornik Statei, n.p., 1971 p202-206, by James R. Moore.

Descriptors: *Semiconductor devices, *Electrooptics, *Microelectronics, *Relaxation oscillators, Translations, USSR.

AD-776 989/6GA PC$3.25/MF$1.45
Westinghouse Electric Corp Baltimore Md Systems Development Div
BINARY-ADDRESSABLE SCAN CONVERSION STORAGE TUBE.
Quarterly rept. no. 8, 15 Jul-14 Oct 73,
Haden J. Bourg. Mar 74, 26p ECOM-0052-8-72
Contract DAAB07-72-C-0052
See also report dated Oct 73, AD-768 908.

Descriptors: *Storage tubes, Electron tube parts, Manufacturing.
Identifiers: Design.

The objective of the contract is to conduct a research and development program leading to the fabrication, testing, and delivery of a binary-addressable scan-conversion storage tube. The tube is to be capable of simultaneous write and nondestructive read operation at video frequencies up to 10 megahertz. The effort during this quarter consisted of acquiring the substrates for the digitizer plates and target. Demountable testing of the flood gun section of the device has resulted in a set of operational parameters for reasonable collimation of the flood beam. Two of the electrode masks have been fabricated, and preparations have been completed for making the remaining four. Investigations into the fabrication technique for the target were completed. Under present program restraints, laser drilling must be used for fabrication of the target as well as the digitizer plates. Development of a fast address circuit for the device has also been terminated, since it was severely hampering other necessary program efforts. The device will be addressed with the circuit used for driving the Phase I device. (Author)

AD-776 996/1GA PC$6.75/MF$1.45
Georgia Inst of Tech Atlanta
HEAT PIPE COOLED MICROWAVE WINDOW.
Final rept.,
Gene T. Colwell, Harold L. Bassett, and James M. Schuchardt. Feb 74, 75p
Contract DAHC60-73-C-0068

Descriptors: *Microwave equipment, *Heat pipes, Windows, Cooling, Dielectrics, Alumina, Beryllium oxides, *Heptanes, Carbon tetrachloride, Computer programs.
Identifiers: *Microwave windows.

The program centered around the examination and selection of suitable dielectric window materials for a heat pipe cooled microwave window and the selection of a working fluid. Two ceramic materials, aluminum oxide and beryllia, were found to be appropriate for window materials in the high average power microwave device. The aluminum oxide material does not possess thermal properties as desirable as the beryllia, but the aluminum oxide is less costly. A number of working fluids were found to have desirable properties, both thermal and microwave, and two of these were very good fluids, Heptane and Carbon Tetrachloride. An experimental heat pipe was constructed and tested as part of this program. The tests indicated that the heat pipe cooled windows could handle up to 2-3 megawatts of RF power at a frequency near 3.0 GHz. (Author)

AD-777 050/6GA PC$3.00/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
POWER LINE TRANSIENT SOURCE AND DIRECTION OF PROPAGATION DETECTOR.
Technical note,
K. T. Huang. Feb 74, 22p Rept no. NCEL-TN-1327

Descriptors: *Electric cables, *Transients, Detectors, Electric power, Electricity, Power, Sources.

The report describes a newly developed power line transient source detector which can locate a transient source in an electrical power system by showing the direction of propagation of the transient along the power line. The advantages of using this detector are: (1) the detector does not disturb the normal operation of the power system and (2) it is light in weight, small in size, easy to operate, and reasonable in cost. (Author)

AD-777 054/8GA PC$8.25/MF$1.45
Westinghouse Research Labs Pittsburgh Pa
GEISHA SEMICONDUCTOR RELIABILITY STUDIES. A PORTION OF CHAIR-GEISHA.
Final rept. 1 Feb 70-31 Dec 71,
John R. Szedon, and Karl K. Yu. 26 Oct 73, 104p
Contract N00014-70-C-0230
See also AD-732 460.

Descriptors: *Semiconductor diodes, *Electron tube targets, *Radiation effects, Silicon nitrides, Polymeric films, Electron irradiation, Degradation, Reliability(Electronics), Fabrication.
Identifiers: GEISHA(Gun Electron Injection for Semiconductor Hybrid Amplification), Gun electron injection for semiconductor hybrid amplification, *Electron beam semiconductor devices, Gate controlled diodes.

The final report describes studies relating to silicon junction diodes to be used for amplifying the current in an electron beam via electron-hole pair production in silicon. Radiation damage effects on the junction reverse leakage are treated in terms of insulator charging effects. Electrical comparisons of shallow diffused and ion implanted junctions are given. Contributions to the thermal impedance of a device of the silicon, gold and beryllia component regions are assessed. Technology is described for producing targets with linear arrays of diodes from a monolithic string of elements formed in silicon. (Author)

AD-893 265/9GA PC$9.75/MF$1.45
RCA Aerospace Systems Div., Burlington, Mass.
ULTRA HIGH RESOLUTION ELECTRONIC IMAGING.
Final technical rept. 1 Jun 70-24 Jan 72,
Michael J. Cantella. Feb 72, 132p CR-72-588-010
AFAL-TR-71-209
Contract F33615-70-C-1683
Distribution Limitation now Removed.

Descriptors: *Vidicons, Resolution, Electron guns, Electron optics, Design, Performance(Engineering).
Identifiers: Return beam vidicons.

The program was concerned with refinement of the design of the ruggedized version of the high-resolution, 4 1/2-inch return beam vidicon (RBV). The principal objectives of the program were (1) increased tube yield, stability, and life through use of a dispenser cathode and (2) increased target 'prepare' potential and speed through gun structural modifications. Other overall program objectives included increased multiplier gain, decreased image shading, and smaller mechanical tolerances. Structural modifications were made to the electron gun which consisted of an improved triode section and a high-current, double-crossover section. Seven electron-gun dummy tubes and ten complete RBV's were fabricated and tested. (Author)

AD-893 472/1GA PC$6.75/MF$1.45
Purdue Univ., Lafayette, Inc. School of Electrical Engineering.
SUPERCONDUCTIVE MICROWAVE SLOW WAVE STRUCTURES.
Final rept.,
C. A. Passow, V. L. Newhouse, and R. L. Gunshor. Jan 72, 71p TR-EE71-35 AFAL-TR-71-292
Contract F33615-70-CO1125
Distribution Limitation now Removed.

Descriptors: (*Superconductors, Microwave equipment), (*Delay lines, Superconductors), (*Pulse compression, Superconductors), (*Strip transmission lines, Superconductors), Superconductivity, Radar equipment, Data storage systems, Electric filters, Switching circuits, Resonant frequency, Electronic switches, Tuning devices.
Identifiers: Slow wave structures, Q factor.

The significance of this research and development to the air force is given by possible improvements of radar systems by using superconducting devices. The report describes the study of three superconductive microwave devices; a highly compact non-dispersive delay line, a pulse compression circuit, and a switching element whose resonant frequency can be varied electrically. It has been established that by use of simple evaporation and photo-etching techniques, non-dispersive microstrip lines with storage times of

several tens of microseconds and gigahertz bandwidths can be constructed. The pulse compression study has shown that compression ratios of over 1,000 may be feasible using a superconductive slow wave structure in which radiation losses are negligible. However such a structure may be impractically large. (Modified author abstract)

AD-894 134/6GA PC$9.00/MF$1.45
RCA Labs., Princeton, N.J.
SOLID-STATE SCAN MOSIAC SENSORS.
Final rept. 21 Jan 71-21 Jan 72,
Paul K. Weimer, Fred G. Durfree, Michael G. Kovac, and Lorand H. Meray. Apr 72, 119p
PRRL-72-CR-8 AFAL-TR-72-78
Contract F33615-71-C-216
Distribution Limitation now Removed.

Descriptors: (*Mosaics(Light-sensitive), Integrated circuits), Electronic scanners, Sensors, Photodiodes, Transients, Transistors, Camera tubes, Gates(Circuits), Decoding, Video signals, Silicon, Shift registers, Photoelectric cells(Semiconductor), Multiplex, Substrates, Metal oxide semiconductors.
Identifiers: Thin films, Charge transfer devices, Schottky diodes, Bucket brigade registers.

A 512 x 512 element photoconductive image sensor with integrated thin-film scanning decoders has been built and scanned at 30 frames per second on laboratory test equipment. Spurious signals due to switching transients and defects in the decoders gave a poor quality picture. A parallel research effort on a 32 x 44 element silicon photodiode sensor which is scanned internally by bucket-brigade charge transfer registers has yielded very encouraging results. A bucket-brigade vertical scan generator drives the gating circuits which connects the horizontal click voltages to each row in sequence. A small solid-state camera was built incorporating the 32 x 44 element sensor. (Modified author abstract)

AD-894 473/8GA PC$7.00/MF$1.45
Martin Marietta Aerospace, Orlando, Fla.
EMP GENERATED WAVEFORMS SUBSYSTEMS AND CIRCUITS.
May 72, 79p OR-11930
Contract DAAH01-71-C-1366
Distribution Limitation now Removed.

Descriptors: (*Transmission lines, Radiation damage), (*Electromagnetic pulses, Radiation damage), Guided missiles(Surface-to-surface), Nuclear explosions, Electronic equipment, Mathematical prediction, Mathematical models, Programming(Computers).
Identifiers: CTRAN computer program, Pershing, XMGM-31A missiles.

The primary objective was to develop a technique for predicting the characteristics of coupled energy on system cables having a wide range of parameters. It was also desired to present the results of the prediction technique in the form of nomographs or charts to be used by system designers. Energy coupled into complex systems generally contains many frequency components and amplitude variations. In order to facilitate design and test specification requirements, a simplified mathematical model of the major frequency and amplitude components was desirable. (Author)

AD-914 109/4GA PC$5.50/MF$1.45
RCA Corp., Lancaster, Pa. Industrial Tube Div.
SILICON INTENSIFIER VIDICON WITH ANTI-BLOOMING TARGET.
Final technical rept. 6 Jun-6 Dec 72,
Robert L. Rodgers. Oct 73, 49p
Contract DAAK02-72-C-0541
Distribution Limitation Now Removed.

Descriptors: (*Image intensifiers(Electronics), *Vidicons), Silicon, Camera tubes, Fiber optics, Diodes(Semiconductor), Reduction, Illumination, Tungsten, Resolution, Targets, Electronic scanners, Images, Diffusion, Gain, Photocathodes, Substrates, Carriers(Semiconductors), Nonlinear systems, Electron beams.
Identifiers: *Blooming, Sit camera tubes, Low light level television, Silicon intensifier targets, Crosstalk, Dark current.

Reduction in blooming in sit camera tubes, the objective of the contract, centered about improvements in the structure of the silicon targets. This was accomplished by utilizing the non-linear structured sink technique, a method of forming a structure in the target which is passive during normal operation, but soaks up the excess holes when the signal diodes are overloaded. In the course of the contract work, a diagnostic sit tube was constructed to isolate various blooming sources, and photographic evidence is presented of blooming effects when various combinations of a lens and fiber optic are used. The evidence shows that the fiber optics has a larger contribution to tube blooming than the non-blooming target. The final prototype (RCA C21130C) exhibited greatly improved blooming characteristics, compared to previous sit tubes. Presented in appendices are brief technical discussions of beam-scanned silicon targets and sit camera tube operation. (Author)

COM-74-10608/9GA PC$7.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
THEORY OF ADJOINT RECIPROCITY FOR ELECTROACOUSTIC TRANDUCERS.
Arthur D. Yaghjian. Feb 74, 79p NBSIR-73-329

Descriptors: *Electroacoustic transducers, Matrices(Mathematics), Partial differential equations.

The first portion of the report demonstrates that a transducer satisfying the spatial impedance-matrix (SIM) relations also satisfies the plane-wave scattering-matrix (PWSM) equations (but that the converse theorem does not hold), and the the alternate expressions of reciprocity are equivalent for transducers that obey both formulations. The second portion of the report examines the equations which characterize the internal behavior of a large class of electroacoustic transducers. A linear operator approach is employed to develop a generalized reciprocity lemma which is used to establish adjoint reciprocity relations between the fields of a given transducer and its adjoint transducers. The linear operator approach facilitates the identification of self-adjoint (reciprocal or antireciprocal) transducers, and the adjoint reciprocity relations have utility in the extrapolation techniques of the PWSM formulation. An adjoint 'reciprocity theorem' and 'principle of reciprocity' are derived from the generalized reciprocity relations. Finally it is shown that the total power inputs for the adjoint transducers belong to the same 'value class' as the original transducer. (Modified author abstract)

COM-74-50306/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Electronic Technology Div.
SEMICONDUCTOR MEASUREMENT TECHNOLOGY.
Quarterly rept., 1 Jul-30 Sep 73,
W. Murray Bullis. Mar 74, 68p NBS-Special Pub-400-1
ARPA Order-2397
Sponsored in part by Defense Nuclear Agency, Washington, D.C. Library of Congress catalog card no. 74-600040.
Paper copy available from GPO $1.15 as C13.10:400-1.

Descriptors: *Semiconductors(Materials), *Semiconductor devices, *Quality control, Silicon, Electrical resistivity, Crystal defects, Integrated circuits, Semiconducting films, Insulated conductors, Process control, Test equipment, Bonding, Transistors, Semiconductor diodes, Microwave equipment, Thermal degradation.
Identifiers: Ultrasonic bonding.

This quarterly progress report describes NBS activities directed toward the development of methods of measurement for semiconductor materials, process control, and devices. Principal accomplishments during this reporting period include (1) extension of the technique for measuring thermally stimulated current and capacitance to include measurements on MOS capacitors, (2) completion of the development of the thermal response method for evaluation of transistor die attachment, (3) analysis of the interlaboratory comparison of transistor scattering parameter measurements, (4) preliminary review of measurement problems in the photolithographic aspects of semiconductor device processing, of problems associated with certain hermeticity testing procedures, and of methods for evaluating metallization step coverage, and (5) initiation of new activity on characterization of oxide films in MOS structures and analysis of diffusion profiles. (Modified author abstract)

N74-16894/9GA PC$4.75/MF$1.45
Australian Post Office Research Labs., Melbourne.
A STUDY OF THE CORROSION PLUG 603 AND SOCKET 610.
G. Flatau, K. Mottram, and K. Keir. Mar 73, 31p
REPT-6781

Descriptors: *Electric connectors, *Electrochemical corrosion, *Failure analysis, Aqueous solutions, Corrosion tests, Electric outlets.

For abstract, see STAR 1208

N74-16954/1GA PC$8.75/MF$1.45
Singer Co., Little Falls, N.J. Kearfott Div.
SOLID STATE SWITCH PANEL.
Final Report.
E. Beenfeldt. 26 Nov 73, 115p NASA-CR-134188, Y256A226
Contract NAS9-13144

Descriptors: *Electric switches, *Magnetic transducers, *Solid state devices, Direct current, Hall effect, Hermetic seals, Magnetoresistivity, Potentiometers (Resistors).

For abstract, see STAR 1208

N74-16958/2GA PC$7.50/MF$1.45
AEG-Telefunken, Ulm (West Germany).
INVESTIGATIONS ON THE DEVELOPMENT OF A NONRECIPROCAL GAAS TRAVELING WAVE AMPLIFIER FOR CONTINUOUS WAVE OPERATION UNTERSUCHUNGEN ZUR REALISIERUNG EINES NICHT-REZIPROKEN GAAS-WANDERFELD-VERSTAERKERS FUER DAUERSTRICHBETRIEB.
R. Becker, R. Engelmann, W. Frey, W. Heinle, and K. Keller. 1973, 88p BMVG-FBWT-73-25
Subm-Sponsored by Bundesmin. Fuer Verteidigung.
In German; English Summary.

Descriptors: *Amplifier design, *Gallium arsenides, *Gunn effect, *Performance tests, *Traveling wave amplifiers, Continuous radiation, Drift (Instrumentation), Equipment specifications, Frequency ranges, Power efficiency, Signal measurement, Space charge, Superhigh frequencies.

For abstract, see STAR 1208

N74-17155/4GA PC$6.25/MF$1.45
Radio Corp. of America, Princeton, N.J.
CATHODOCHROMIC STORAGE DEVICE.
Final Report, 3 Apr. 1968 - 2 Apr. 1969.
D. R. Boosmworth, and W. H. Moles. 2 Apr 69, 63p NASA-CR-132920
Contract NAS5-10636

Descriptors: *Cathode ray tubes, *Data storage, *Display devices, Electron beams, Phosphors, Television systems.

For abstract, see STAR 1208

N74-17454/1GA PC$4.00/MF$1.45
Paris Univ., Orsay (France). Lab. of Plasma Physics.
DESCRIPTION OF THE ENERGY SOURCE PROJECT DELIVERING 1 MEGAJOULE IN 1 MICROSECOND DESCRIPTION DU PROJET D'UNE SOURCE D'ENERGIE DELIVRANT 1 MEGAJOULE EN 1 MICROSECONDE.
F. Damidau, and C. Rioux. Apr 72, 17p LF-3
Language in French.

Descriptors: *Circuit breakers, *Electric energy storage, *Electrical engineering, *Electromechanical devices, *Impulse generators, Electric fuses, Electric power transmission, Electrical insulation, Energy conversion efficiency, Inductance.

For abstract, see STAR 1208

PAT-APPL-315 748 PC$4.00/MF$1.45
Department of the Air Force Washington D C
ADAPTER FOR INSTALLING COMPONENTS IN WIRE HARNESS.
Patent Application,
C. R. Powell. Filed 15 Dec 72, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Adapters, Patents, Circuits, Installation.
Identifiers: *Patent applications, PAT-CL-174-52.

The patent application describes an 'in-line' adapter that provides a self-supporting enclosure for the insertion of electrical components in an electrical circuit anywhere along a conductor of the electrical circuit.

9B. Computers

AD-776 298/2GA PC$15.00/MF$1.45
Pattern Analysis and Recognition Corp Rome N Y
MULTISPECTRAL ANALYSIS SOFTWARE.
Final rept. Jul 72-Jun 73,
John C. Lietz, Alexander J. Zanon, Gerald T. Stevens, Robert E. Bozek, and Bruce K. Optiz.
Nov 73, 865p RADC-TR-73-339
Contract F30602-72-C-0521

Descriptors: *Multiband spectral reconnaissance, *Photointerpretation, *Pattern recognition, *Computer programs, Instruction manuals.
Identifiers: OLPARS(On Line Pattern And Recognition System), On line pattern and recognition system, Edge detection, Feature extraction, Image processing, Image enhancement, PDP-11/20 computers.

The report is prepared in the form of a User's Manual for personnel engaged in the operation of the RADC SCORE (Spectral Combinations for Reconnaissance Exploitation) system. The SCORE program has as its major objective the development and implementation of a multispectral analysis system to identify military targets based on their spectral signature. The specific objective of the subjective contract was the development and implementation of applications software in the form of preprocessing and analysis routines for use in extracting spectral signatures (features) from multispectral data. The spectral features are intended for use on the On-Line Pattern and Recognition System (OLPARS) in the design of enhancement/recognition logic for targets of interest. Parallel to the development of the SCORE program has been the development of the Image Feature Extraction System (IFES). IFES is being implemented as a research tool for use in extracting information from a single image based on the spatial characteristics of targets. SCORE and IFES reside within one software framework in the PDP-11/20/SDS-800 system. (Modified author abstract)

AD-776 323/8GA PC$4.00/MF$1.45
Massachusetts Computer Associates Inc Wakefield
COMPILER DESIGN FOR THE ILLIAC-4.
Final rept.,
Charles Muntz, Mathew Myszevski, and Stuart Schaffner. 28 Mar 74, 94p* Rept no. CADD-7403-2811
See also report AD-765 351.

Descriptors: *Parallel processors, *Compilers, Transformations, Control sequences, Programming languages, Memory devices, Subroutines.
Identifiers: ILLIAC, *ILLIAC 4 computer, IVTRAN programming language.

The major thrust of the effort is the analysis, design, and implementation of software which will make the ILLIAC-4 easily usable by the scientific programming community. Many of the proposed ILLIAC-4 applications exist in large part as FORTRAN codes which are undergoing extensive design, development, and evaluation on a variety of machines. Questions arise such as the following: How will they perform on the ILLIAC. Can automatic programming aids be developed to allow the use to existing FORTRAN as the basis for an ILLIAC implementation. These issues are fundamental to the project.

AD-776 364/2GA PC$3.75/MF$1.45
Army Signal Center and School Fort Monmouth N J Computerized Training System
AN ON-LINE ELECTRONICS GRAPHIC SYMBOL SET FOR THE PLATO IV COMPUTER SYSTEM.
Technical rept.,
Peggy A. McClintock, and Donald A. Kimberlin.
Oct 73, 61p Rept no. CTS-TR-73-3

Descriptors: *Computer graphics, *Electronics, *Computer aided instruction, Circuits, Solid state electronics, On line systems, Instruction manuals.
Identifiers: *PLATO 4 system.

An electronics graphics symbol set for on-line construction of electrical and electronics schematic diagrams is described. Specific procedures involving off-line and on-line activities are presented for the development and entry of schematic diagrams using a stored set of symbols. An example of the commands and coding required for the construction of diagrams is provided. (Author)

AD-776 371/7GA PC$3.25/MF$1.45
Technion - Israel Inst of Tech Haifa Dept of Computer Science
MACRO PROCESSOR FOR EFFICIENT PROGRAM PREPARATION.
Final technical rept.,
E. Kantorowitz. Jul 73, 32p
Contract DAJA37-72-C-3569

Descriptors: *Computer programs, *Compilers, Programming languages, Recursive functions, Memory devices, Israel.
Identifiers: Macroprocessors, Macroprogramming, ALGOL 60 programming language, Assembly languages, Coursewriter programming language.

A study is presented of the use of macro processors for the production of reliable programs at a reasonable cost. As a vehicle for study, a programming system was developed, based on an extension of the ML/I macro processor. The system, called EPS (Extensible Programming System), was designed to support all significant activities in the process of program production and maintenance. EPS facilitates debugging, maintenance, and both modular and structured programming. In order to avoid the disadvantages of assembly language programming, EPS was designed to facilitate the implementation of special purpose high level languages. The system facilitates implementations of these languages such that highly efficient object code can be produced. EPS saves storage and implementation costs by consolidating facilities that are common in a number of the implemented languages. The relative ease with which special purpose languages may be realized in EPS was verified by the implementation of a subset of COURSEWRITER and of an ALGOL 60 like language. (Author)

AD-776 377/4GA PC$3.25/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
OPERATIONAL TESTS OF THE COHERENT OPTICAL FINGERPRINT IDENTIFICATION SYSTEM (COFIDS).
Final rept.,
David W. Samuels, E. B. Shank, and Brenda K. Thein. Dec 73, 26p* Rept no. LWL-TR-74-09

Descriptors: *Identification systems, *Pattern recognition, *Hands, Holograms, Correlation techniques, Security, Personnel.
Identifiers: COFIDS(Coherent Optical Fingerprint Identification Systems), Coherent optical fingerprint identification systems, *Fingerprints, Cross correlation.

At the request of the U.S. Army Office of the Provost Marshall General, the U.S. Army Land Warfare Laboratory performed a test and evaluation of the Coherent Optical Fingerprint Identification System (COFIDS). This system employs the techniques of optical holography to encode fingerprint details and store such information, with high data density, on miniature photographic films. Identification is performed by comparing fingerprints with the hologram using optical cross-correlation. The test, involving over 100 people of USALWL, was carefully designed and instrumented to provide complete statistics of performance. The evaluation indicates that the system provides a highly foolproof means of personnel identification. Equipment improvements are desirable to automatically compensate for fingerprint variability and to reduce the learning process required of users. (Author)

AD-776 451/7GA Reprint
Texas Univ Austin Dept of Electrical Engineering
SOME DISTRIBUTION-FREE ASPECTS OF PAGING ALGORITHM PERFORMANCE.
P. A. Franaszek, and T. J. Wagner. Dec 72, 12p
AFOSR-TR-74-0317
Grant AF-AFOSR-2371-72
Prepared in cooperation with IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y.
Revision of report dated Apr 72.
Availability: Pub. in Jnl. of the Association for Computing Machinery, v21 n1 p31-39 Jan 74.

Descriptors: *Memory devices, Algorithms, Probability density functions, Theorems.
Identifiers: *Paging, Computer storage management.

The topic of the paper is a probabilistic analysis of demand paging algorithms for storage hierarchies. Two aspects of algorithm performance are studied under the assumption that the sequence of page requests is statistically independent: the page fault probability for a fixed memory size and the variation of performance with memory. Performance bounds are obtained which are independent of the page request probabilities. It is shown that simple algorithms exist which yield fault probabilities close to optimal with only a modest increase in memory. (Author)

AD-776 640/5GA PC$4.50/MF$1.45
Hughes Aircraft Co Fullerton Calif Ground Systems Group
HARDWARE COMMAND AND CONTROL SYSTEM STUDY.
Final technical rept. 18 Jun-18 Dec 73,

J. R. Fogarty, J. H. Rowan, D. A. Smith, and M. D. Swesen. 18 Feb 74, 117p Rept no. FR-74-11-20
Contract N00123-73-C-2130

Descriptors: *Command and control systems, Data processing, Scheduling, Queueing theory, Multiprocessors, Computer programming.
Identifiers: AN/UYK-20, AN/UYK-7.

The report specifies a controlling entity termed the Hardware Command and Control Manager (HCCM) which integrates and controls the activities of distributed processes. The processes controlled by the HCCM may vary in level of complexity from a special purpose hardware function, through the process realized as mini-computers, to large scale processing systems requiring large central processors. The control functions provided by the HCCM are executive or operating system functions found in traditional software systems. The software functions in this class which are appropriate are optimized through implementation in hardware and form the HCCM. These functions are delineated in detail in this report along with the hardware blocks necessary to perform these operations. (Author)

AD-776 819/5GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Engineering Science Operations
A MEASURE OF PATTERN RECOGNITION EFFECTIVENESS WITH APPLICATION TO FEATURE SELECTION.
Rept. for Mar-Sep 73,
Joseph W. Duroux. 15 Feb 74, 21p Rept no. TR-0074(9320)-3 SAMSO-TR-74-63
Contract F04701-73-C-0074

Descriptors: *Pattern recognition, *Statistical analysis, Bayes theorem, Probability density functions, Sampling, Classification.
Identifiers: *Feature selection.

A measure of effectiveness of a statistical pattern recognition process is suggested and applied to the problem of feature selection. The classification process is one which approximates the class populations by probability distributions in the feature space based on samples of prototype patterns. It uses a Bayes classifier. The suggested measure of effectiveness is a normalized estimate of mutual information obtained directly from the prototypes. The feature selection procedure chooses likely feature subsets and tests them against thresholds related to the effectiveness of the full set of features. The subsets are chosen by ordering the original features according to individual effectiveness and then alternately truncating and permuting the remaining space until a minimum is reached. The minimum is quasioptimum in the sense that it contains no useless features. (Author)

AD-776 929/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONTROL: A TECHNICAL BASE.
25 Mar 74, 7p Rept no. FTD-HT-23-1336-74
Edited trans. of Izvestiya (USSR) n223 p1, Oct 73, by Charles R. Ostertag, Jr.

Descriptors: *Automatic control, *Control systems, Computers, Translations, USSR.

AD-776 995/3GA PC$3.25/MF$1.45
Bolt Beranek and Newman Inc Canoga Park Calif
TERMINAL INTERFACE MESSAGE PROCESSOR: SPECIFICATIONS FOR THE INTERCONNECTION OF TERMINALS AND THE TERMINAL IMP.
R. D. Rettberg. Sep 72, 47p Rept no. BBN-2277

Descriptors: *Data processing terminals, *Communications networks, Remote terminals, Interfaces, Modems.
Identifiers: ARPA computer network, *Computer networks, IMP(Interface Message Processors), Interface message processors.

The document contains information for connecting terminals and modems to the terminal interface message processor.

AD-777 008/4GA PC$3.25/MF$1.45
Control Data Corp Rockville Md Ocr Operations
ADVANCED DEVELOPMENT MODEL (FEASIBILITY TYPE) TACTICAL PAGE READER.
Final rept. 1 Jun 71-31 Jul 73,
William Fischer, and Sidney Greenwald. Aug 73, 34p ECOM-0255-F-71
Contract DAAB07-71-C-0255
See also AD-750 613.

Descriptors: *Reading machines, *Optical character recognition, Optical scanning, Optical equipment, Printed circuits, Photodiodes, Control panels, Feasibility studies.

The final report on the Tactical Page Reader covers work done during the entire course of the project. The report describes construction and adjustment of the final version. The second elliptical-cylindrical reflector for the main illumination was built according to the dictates of experimental results with the first design. The details of design and adjustment are discussed herein. Edge detectors (three) are used to detect the passage of the page top and bottom edges. The Paper Handling subassemblies and their operation are discussed. Error correction procedures and related hardware are described. The keyboard and Operator Control Panel are covered completely. The function of each item is described. The logical block diagram of the reader is described with all logical functions detailed. The descriptions are given of the locations and functions of the various electronic parts. Printed circuit boards are all described as well as details of the power supplies. Also contained in this report is a section on recommendations for future developments, improvements, and design modifications. In the final section a list of pertinent machine characteristics is included for ready reference. (Author)

AD-911 668/2GA PC$15.00/MF$1.45
System Development Corp., Huntsville, Ala.
REAL-TIME ADVANCED DATA PROCESSING PARALLEL ELEMENT PROCESSING ENSEMBLE (PEPE). ATTACHMENT 1. PEPE FUNCTIONAL SIMULATION CALIBRATION MODEL AND SYSTEM VERIFICATION MODEL DESCRIPTIONS.
Final rept.,
J. B. Falk. May 73, 238p TM-HU-048/505/00
Contract DAHC60-73-C-0060
Distribution Limitation now Removed. See also AD-911 667.

Descriptors: (*Data processing systems, Real time), Computer programs, Antimissile defense systems, Simulation, Calibration, Models(Simulations), Radar, Threat evaluation, Interception, Interfaces, Subroutines, Guidance, Reentry vehicles, Algorithms, Kill probabilities, Systems engineering.
Identifiers: Computer software, Kalman filters, Medium scale integration, Parallel element processing ensemble, *Parallel processing, *PEPE(Parallel Element Processing Ensemble), Scenarios.

The PEPE simulation project has had the responsibility of validating the design of the MSI PEPE by functional simulation. This validation was achieved by demonstrating that the performance characteristics of the MSI PEPE are superior to those of the IC design used in the PHSD demonstrations. Toward achieving design validation, two functional simulation models were constructed; A calibration model and a system verification model. The purpose of this document is to describe the functions performed by the action sequence chains that comprise these two models.

AD-914 517/8GA PC$14.25/MF$1.45
Raytheon Co., Wayland, Mass. Equipment Div.
ADVANCED DIGITAL SIGNAL PROCESSOR DESIGN STUDY. VOLUME II. DESIGN CONCEPT.
Final rept. 4 Apr-4 Nov 73,
T. Allen, J. Glass, R. Hynes, and D. Perkins. Nov 73, 224p ER73-4426-Vol-2
Contract DAHC60-73-C-0065
Distribution Limitation now Removed.

Descriptors: (*Signal processing, Digital systems), Computer storage devices, Pulse compression, Matched filters, Waveform generators, Digital-to-analog converters, Bandwidth, Data storage systems, Computer programming, Interfaces, Antimissile defense systems, Multiplex, Trailing edge, Radar, Power supplies, Reliability(Electronics), Sequences, Algorithms, Video signals, Specifications, Broadband, Shift registers, Detection, Leading edge.
Identifiers: *Signal processors, Data management, Local oscillators, Flip flops, Fast Fourier transforms, Butterworth filters, Random access memories, Metal oxide semiconductors, Post processors.

This volume describes a design concept of a digital signal processor designed to meet the specified system requirements. The concept uses the techniques recommended as a result of the studies described in volume I. Each of the following subsystems are described separately: digital waveform generator, IF conversion, input data management, matched filter, post processor, test sequence controller, and control and interface. In addition, a mechanical design concept, thermal analysis, and reliability analysis for the concept described are included. (Author)

AECL-4698 PC$3.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
FORSIM: A FORTRAN-ORIENTED SIMULATION PACKAGE FOR THE AUTOMATED SOLUTION OF PARTIAL AND ORDINARY DIFFERENTIAL EQUATION SYSTEMS.
M. B. Carver. Nov 73, 35p
U.S. Sales Only.

Descriptors: (*Computer codes, *F codes), (*Differential equations, Computer codes), Errors, Fortran, Integrals, Time dependence.

For abstract, see NSA 29 07, number 17961.

BNL-18222 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
USA/CANADA DECUS DECSYSTEM-10 ACTIVITIES.
W. H. Kropp. 3p CONF-730948-1

Descriptors: (*Computers, *Management), Canada, Electronic equipment, Maintenance, Meetings, Planning, Programming languages, Usa.

For abstract, see NSA 29 07, number 17947.

BNWL-1795 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
MICROPROCESSOR SAMPLED DATA PROCESS CONTROLLER.
T. A. Seim. Nov 73, 117p
Contract AT(45-1)-1830

Descriptors: (*Brazing, Temperature control), (*Temperature control, *Computers), (*Control systems, Temperature control), (*Data processing, Control systems), Calibration, Economics, Electronic circuits, Feedback, Maintenance, Operation, Power supplies.

For abstract, see NSA 29 07, number 17948.

COM-74-10600/6GA PC$60.00/MF$60.00
National Technical Information Service, Springfield, Va.

DIRECTORY OF COMPUTERIZED DATA FILES AND RELATED SOFTWARE.
Mar 74, 171p* NTIS-SR-74-01
See also COM-74-10631.

Descriptors: *Computer programs, *Catalogs(Publications), Abstracts, United States Government, FORTRAN, COBOL.

Available for the first time is the Vanguard of Federally sponsored machine readable data files and related software catalog. These data files and software fall into the broad categories of Demography, Social Science, Government, Economics, Science and Technology. These broad categories are further broken into forty-three subcategories. More than 500 data files are covered from 60 major Government agencies without breaching agency commitments of confidentiality. There are no disclosures of individuals or individual companies which would give confidential information or proprietary financial data. Each entry contains a unique catalog reference number, the generating agency, file title, date of coverage, number of reels of tape, report number, magnetic tape recording mode in tracks, density, parity and character code. Each entry contains an abstract which describes the purpose, scope and file coverage, input source, publications produced, where applicable and a list of software availnble with the file. The catalog is indexed according to subject terms, generating agency and report number.

COM-74-10631/1GA Mag Tape $97.50;Foreign $122.50
National Technical Information Service, Springfield, Va.
DIRECTORY OF COMPUTERIZED DATA FILES AND RELATED SOFTWARE,
Robert A. Jaxel. Mar 74, 1 reel mag tape* NTIS-SR-74-01-MT
See also COM-74-10600.
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Computer programs, *Catalogs(Publications), *Magnetic tapes, Abstracts, United States Government, FORTRAN, COBOL.

The magnetic tape contains federally sponsored machine readable data files and related software catalog. These data files and software fall into the broad categories of Demography, Social Science, Government, Economics, Science and Technology. These broad categories are further broken into forty-three subcategories. More than 500 data files are covered from 60 major Government agencies without breaching agency commitments of confidentiality. There are no disclosures of individuals or individual companies which would give confidential information or proprietary financial data. Each entry contains a unique catalog reference number, the generating agency, file title, date of coverage, number of reels of tape, report number, magnetic tape recording mode in tracks, density, parity and character code. Each entry contains an abstract which describes the purpose scope and file coverage, input source, publications produced, where applicable and a list of software available with the file. The catalog is indexed according to subject terms, generating agency and report number.

COM-74-50088/5GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Systems and Software Div.
CODASYL DATA DESCRIPTION LANGUAGE JOURNAL OF DEVELOPMENT, JUNE 1973.
Handbook.
Jan 74, 152p NBS-HB-113
Library of Congress Catalog no. 73-600347.
Paper copy available from GPO $1.70 as C13.6/2:113.

Descriptors: *Programming languages, Syntax, Semantics, COBOL, Specifications.
Identifiers: *DDL programming language, Schema theory.

The report discusses the work of the CODASYL Data Description Language Committee. The Committee was assigned the tasks of establishing ways to aid the functions of data administration and systems administration. The approved Data Description Language specifications contain the syntax and semantic rules that permit the description of the structure and contents of a data base in a language independent of, but common to, many other high level programming languages. The language specifications will have a significant impact on the development of functionally compatible data base management systems and will increase the portability of programs between different computer systems. Though not part of the approved language specifications, the presentation of the major concepts will help in the understanding of the specifications. Similarly, the background and history information will help explain the evolutionary growth of the Data Description Language. (Modified author abstract)

COM-74-50256/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SYNTAX-DIRECTED LEAST-ERRORS ANALYSIS FOR E LANGUAGES: A PRACTICAL APPROACH.
Final rept.,
Gordon Lyon. 1974, 12p
Pub. in Communications of the ACM (Association of Computing Machinery) v7 n1 p3-14 Jan 74.

Descriptors: *Computer programming, *Syntax, Dynamic programming, Grammars, Algorithms.
Identifiers: Parsing, Context free grammars.

A least-errors recognizer is developed informally using the well-known recognizer of Earley, along with elements of Bellman's dynamic programming. The analyzer takes a general class of context-free grammars as drivers, and any finite string as input. Recognition consists of a least-errors count for a corrected version of the input relative to the driver grammar. The algorithm design emphasizes practical aspects which help in programming it.

COM-74-50278/2GA MF$1.45
National Bureau of Standards, Washington, D.C.
A GUIDE TO NETWORKING TERMINOLOGY.
Interim technical note,
A. J. Neumann. Mar 74, 30p NBS-TN-803
Grant NSF-AG-350
Paper copy available from GPO $0.80 as C13.46:803.

Descriptors: *Computers, *Telecommunications, *Terminology, Definitions.
Identifiers: *Computer networks.

A selected set of terms and definitions relating to computer networking is presented in a coherent manner. An introduction gives the rationale for the glossary, defines the scope by a brief tutorial overview, and states the glossary format and conventions. The glossary is arranged alphabetically and contains about 140 definitions and associated terms. The sources of many terms are cited and modifiers indicate the status of definitions. A complete listing of source material is appended. (Author)

COO-2118-46 PC$5.25/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
DESIGN OF AN ALGORITHM FOR THE DISPLAY OF VISIBLE SURFACES.
W. Donovan. Oct 73, 61p UIUCDCS-R-73-592
Contract AT(11-1)-2118

Descriptors: (*Display devices, *Surfaces), (*Algorithms, Surfaces), Computers.

For abstract, see NSA 29 07, number 17949.

COO-2118-48 PC$9.00/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
COMPUTER METHODS FOR ANALYSIS AND SYNTHESIS OF VISUAL TEXTURE.
S. N. Jayaramamurthy. Sep 73, 137p UIUCDCS-R-73-601
Contract AT(11-1)-2118

Descriptors: (*Vision, *Texture), (*Images, Texture), (*Display devices, *Computers), Configuration, Information theory, Shape.

For abstract, see NSA 29 07, number 17950.

KFK-1885 PC$6.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany).
DISPLAY: A TSO COMMAND PROCESSOR FOR FAST OUTPUT OF ALPHANUMERIC DATA ON A KFK STORAGE TUBE.
W. Strolz. Nov 73, 81p
In German. U.S. Sales Only.

Descriptors: (*Data display systems, *Operation), Display devices, Ibm computers, Image storage tubes.

For abstract, see NSA 29 07, number 17951.

N74-16897/2GA PC$4.00/MF$1.45
Centre National d'Etudes Spatiales, Bretigny-sur-Orge (France).
SIMULATION OF THE PROCESSING OF SCIENTIFIC TELEMETRY DATA OF TIROS N SIMULATION DU TRAITEMENT DE LA TELEMESURE SCIENTIFIQUE TIROS N.
A. Cariou. 1973, 17p
Conf-Presented at the Intern. Seminar on Simulation and Space. Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Data collection platforms, *Data processing, *Telemetry, *Tiros satellites, Digital simulation, Global tracking network, Ground stations, Position (Location).

For abstract, see STAR 1208

N74-16940/0GA PC$7.50/MF$1.45
Analysis and Computer Systems, Inc., Burlington, Mass.
DATA PROCESSING SYSTEM FOR THE INTENSITY MONITORING SPECTROMETER FLOWN ON THE ORBITING GEOPHYSICAL OBSERVATORY-F (OGO-F) SATELLITE.
Final Report, 1 Jul. 1970 - 30 Jun. 1973.
A. G. Cronin, and J. R. Delaney. Jul 73, 87p
NASA-CR-136827, AFCRL-TR-73-0655
NASA ORDER S-99821, Contract F19628-70-C-0298

Descriptors: *Data processing, *Ogo-6, *Spectrometers, Fortran, Solar radiation, Telemetry.

For abstract, see STAR 1208

PB-226 691/4GA PC$3.00/MF$1.45
Stanford Univ., Calif. Dept. of Computer Science.
MONITORS: AN OPERATING SYSTEM STRUCTURING CONCEPT,
C. A. R. Hoare. Nov 73, 27p STAN-CS-73-401
Grant NSF-GJ-36473X
Prepared in cooperation with Queen's Univ., Belfast (Northern Ireland).

Descriptors: *Operating systems(Computers), Boolean functions, Time sharing, Scheduling, Design, Algorithms.
Identifiers: Semaphores.

The paper develops Brinch-Hansen's concept of a monitor as a method of structuring an operating system. It introduces a form of synchronization, describes a possible method of implementation in

terms of semaphores, and gives a suitable proof rule. Illustrative examples include a single resource scheduler, a bounded buffer, an alarm clock, a buffer pool, a disc head optimizer, and a version of the problem of readers and writers.

PB-226 700/3GA PC$10.00/MF$1.45
National Institutes of Health, Bethesda, Md. Div. of Computer Research and Technology.
DCRT DATA MANAGEMENT SYSTEM - USERS GUIDE,
J. Emmett Ward, and John Parks. Jul 73, 113p*
See also PB-226 701.

Descriptors: *Management systems, *Information systems, *Computer programming, Programming manuals, Information retrieval, Compilers, Data retrieval.
Identifiers: *Management information systems, IBM 360 computers, IBM 370 computes.

The DCRT Data Management System is designed to fulfill the specific needs of the NIH by providing a set of standard packages (tools) to solve problems relating to file creation, maintenance, retrieval and data analysis. This system when passed on to a user provides the tools necessary to support his Management Information System with little or no programming required. It provides a user of the DCRT computer facility with complete source language generation of programs for file creation, update and editing, retrieval and data analysis. In addition it offers the capability to take an existing file and reformat that file to conform to a new need.

PB-226 836/5GA PC$3.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Project MAC.
DISCRETE COMPUTATION: THEORY AND OPEN PROBLEMS.
Interim Scientific rept.,
Albert R. Meyer. Jan 74, 37p MAC-TM-39
NSF/OCA- GJ34671
Grant NSF-GJ-34671

Descriptors: *Computation, Algorithms, Binary digits, Turing machines, Recursive functions, Computer programming.
Identifiers: MAC project.

PB-226 879/5GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
A SUMMARY OF CURRENT RESEARCH IN COMPUTER NETS.
Research rept.,
Edward K. Bowdon, Sr. Nov 73, 13p UIUCDCS-R-73-606
Grant NSF-GJ-28289
Presented at the Hawaii International Conference (7th), on Systems Sciences.

Descriptors: *Computer networks, Queueing theory, Scheduling, Mathematical models, Algorithms.

In the paper the author presents some recent developments in the research program being conducted at the University of Illinois to formulate analytical tools for system modeling and analysis of real time computer networks. Specifically, there are theoretical studies being conducted of geographically distributed network computers in three separate and distinct areas: Computer Network Modeling, Center Throughput Analysis, and System Performance Evaluation. Taken together these three areas provide the computer systems analyst with the necessary tools for modeling, analyzing, and evaluating system performance in existing and proposed network configurations - a first step in the long road to achieving economic viabilityters.

PB-227 044/5GA PC$4.50/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
COMPUTATIEXITY OF FORMAL TRANSLATIONS.
Technical rept.,
J. Hartmanis. Dec 73, 30p CU-CSD-73-192
Grant NSF-GJ-33171

Descriptors: *Programming languages, *Translator routines, Recursive functions, Computation, Compilers, Syntax, Algorithms.
Identifiers: *Computational complexity, Goedel numberings.

The purpose of the paper is to define a mathematical model for the study of quantitative problems about translations between universal languages and to investigate such problems. The results derived in this paper deal with the efficiency of the translated algorithms, the optimality of translations and the complexity of the translation process between different languages. (Author)

PB-227 077/5GA PC$4.75/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
FUNCTIONAL SCHEMAS WITH NESTED PREDICATES.
Technical rept.,
Zvi Galil. Dec 73, 33p CU-CSD-73-189

Descriptors: *Computer programming, *Mathematical logic, Artificial intelligence, Decision making, Computation, Theorems.
Identifiers: *Schema theory, Nested predicates.

A class of (monadic) functional schemas with nested predicates is defined. It is shown that termination, divergence and freedom problems for these schemas are decidable. It is proved that when the schemas are more general the freedom problem is undecidable. A procedure is given for deleting the identity function from the schema's definition at the cost of increasing k by 1 when k is the maximum depth of nesting. Part of the results extend earlier results about schemas without nesting. The present algorithm for checking freedom is not a natural extension of the previous one. Furthermore, using the algorithm for schemas without nesting yields a much more efficient way of deciding freedom than the algorithm suggested in the previous paper. (Modified author abstract)

PB-227 222/7GA PC$11.25/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
VIPTRAN - A PROGRAMMING LANGUAGE AND ITS COMPILER FOR BOOLEAN SYSTEMS OR PROCESS CONTROL EQUATIONS.
Master's thesis,
Alfred Charles Weaver. Nov 73, 164p UIUCDCS-R-73-603

Descriptors: *Programming languages, *Compilers, *Boolean algebra, *Process control, Mathematical logic, FORTRAN, Real time operations, Theses.
Identifiers: *VIPTRAN programming language.

The solution of some industrial process control problems can be expressed as a system of Boolean algebra equations using sensing inputs from and outputs to the real world. If this system is solved sequentially, cyclically, and in real time, the outputs may be used directly to control the state of real world devices. VIPTRAN is a high-level FORTRAN-like language which allows the programmer to express his Boolean system symbolically in logical (Boolean) equations. The VIPTRAN compiler reduces the input to machine code for the VIP process controller, and can plot the resulting system as a relay tree. The concept is extensible to other industrial controllers.

PB-230 237/0GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
ON THE COVERING PROBLEM FOR UNAMBIGUOUS CONTEXT-FREE GRAMMARS,
M. Dennis Mickunas. Feb 74, 14p UIUCDCS-R-74-624

Descriptors: *Programming languages, *Grammars, Semantics, Set theory, Theorems.
Identifiers: *Context free grammars.

It is shown that every unambiguous grammar which does not generate the empty string is covered by a Lambda-free grammar. Every unambiguous grammar which does generate the empty string is covered by a grammar which is partitioned into a Lambda-free portion and a portion which generates only the empty string. Finally, every unambiguous grammar is covered by such a partitioned grammar in operator form. (Author)

PB-230 304/8GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
ON THE STRONG COVERING PROBLEM FOR LR(K) GRAMMARS.
Research rept.,
M. Dennis Mickunas. Feb 73, 19p UIUCDCS-R-74-625

Descriptors: *Programming languages, *Transformational grammars, Set theory, Theorems.
Identifiers: Parsing, Context free grammars.

A formal definition of one grammar, G' strongly covering another grammar, G is presented. Conditions under which the ability to parse G in an LR fashion implies the ability to parse G' in an LR fashion are developed. Constructive proofs are presented for the following formerly open problems. Every LR(k) grammar, G is strongly covered by an LR(1) grammar. Moreover, if L(G) is strict deterministic, then G is strongly covered by an LR(O) grammar. (Author)

PB-230 444/2GA PC$9.25/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
RESEARCH INITIATION: A THEORETICAL INVESTIGATION OF DIAGNOSABLE LOGIC SYSTEMS.
Final rept. May 72-Dec 73,
Festus G. Gray, and B. A. Prasad. Dec 73, 123p
NSF-OCA-GJ32718-FAULTS
Grant NSF-GJ-32718

Descriptors: *Computer systems hardware, *Logic design, *Logic circuits, Reliability(Electronics), Electrical faults, Trees(Mathematics), Mathematical logic, Theorems.
Identifiers: Fault tolerant computing, Sequential machines, Cellular arrays.

The report describes research directed toward the solution of problems incurred in the design, analysis, and diagnosis of reliable computing systems. The ultimate goal of such research is to develop a formal theory of faulty systems that will serve engineers concerned with the design of diagnosable systems, much as classic switching theory serves those concerned only with fault-free systems.

PB-230 614/0GA PC$5.50/MF$1.45
Iowa State Univ., Ames. Cyclone Computer Lab.
SOURCE PROGRAM ANALYSIS AND OBJECT STRING GENERATION ALGORITHMS AND THEIR IMPLEMENTATION IN THE SYMBOL 2R TRANSLATOR.
Master's thesis,
James Wallace Anderberg. Feb 74, 180p* NSF-OCA-GJ33097-CL7410
Grant NSF-GJ-33097

Descriptors: *Central processing units, *Translator routines, Compilers, Mathematical logic, Shift registers, Algorithms, Theses.
Identifiers: *SYMBOL 2R computer.

The SYMBOL 2R system is composed of a number of hardwired, independent processors. One of these, the Translator, is responsible for performing the syntax analysis on the source code and generating the object code which is subsequently executed by the Central Processor. The paper has two main objectives. The first is to provide an explanation of the function and operation of the Translator at a general introductory level. Secondly, a detailed description of the syntax analysis and object string generation logic is provided to serve as a basis for maintainence and future modification of this processor.

SLA-73-7033 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SURVEY OF REVISIONS AND EXTENSIONS TO AMERICAN NATIONAL STANDARD FORTRAN X3.9-1966. INITIALLY APPROVED BY ANSC X3J3.
C. B. Bailey. 1973, 16p CONF-731206-1

Descriptors: (*Fortran, *Standards), Computers, Programming.

For abstract, see NSA 29 07, number 17957.

SLA-73-967 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
BYTE-MANIPULATION SUBROUTINES FOR THE PDP-10 COMPUTER.
M. C. Jones. Jan 74, 14p
Contract AT(29-1)-789

Descriptors: (*Pdp computers, *Programming), Computer codes, Fortran, Programming languages.

For abstract, see NSA 29 07, number 17955.

UCID-16354 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
EZQUERY.
F. Holcomb, J. Kroes, and T. Jessen. 18 Oct 73, 37p
Contract W-7405-Eng-48

Descriptors: Data processing, Display devices, Information retrieval, Information systems.

For abstract, see NSA 29 07, number 17938.

UCID-30062 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
COMBINE: A DATA BASE MANIPULATION CODE.
C. M. Geertgens. 4 Dec 73, 12p
Contract W-7405-eng-48

Descriptors: (*Data processing, Computer codes), (*Computer codes, *C codes), (*Data acquisition systems, Computer codes).

For abstract, see NSA 29 07, number 17939.

UCRL-74795 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
INFLUENCE OF MACHINE ORGANIZATION ON ALGORITHMS.
J. L. Owens. May 73, 12p CONF-730579-1

Descriptors: (*Computers, *Algorithms), (*Programming, Algorithms), Comparative evaluations, Computer calculations.

For abstract, see NSA 29 07, number 17960.

9C. Electrical and Electronic Engineering

AD-776 347/7GA PC$8.00/MF$1.45
Army Communications Command Fort Huachuca Ariz
CONCEPT OF OPERATION FOR USACC ELECTROMAGNETIC COMPATIBILITY PROGRAM (EMCP).
1 Nov 73, 98p Rept no. ACC-CCP-105-9

Descriptors: *Electromagnetic compatibility, Army, Communication equipment, Electronic equipment.

The goals of the EMC Program are to: insure efficient integration of engineering, management, and quality assurance tasks, as related to Electromagnetic compatibility (EMC); insure intrasystem and intersystem design and operational electromagnetic compatibility; insure continuous traceability of EMC requirements and design alternatives throughout the program so that the sources and impact of design changes and deficiencies in equipment and subsystems, and the impact on contractual performance requirements are promptly determined, accurately identified, and properly communicated; permit timely and optimum redefinition of EMC requirements in response to changes resulting from problems identified through performance measurements; and to provide input to, and insure compatibility with, all interfacing management and information systems employed in the project.

PATENT-3 117 586 Not available NTIS
Department of the Interior, Washington, D.C.
AUTOMATIC CONTROLLER.
Patent,
Louis T. Cleaver. Filed 30 Jun 61, patented 14 Jan 64, 6p PAT-APPL-121 259, DOCKET/REC-522
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Automatic control equipment, *Patents, Electric control.
Identifiers: Pat-CL-137-78.

The patent relates to improvements in an electrical apparatus responsive to signals produced by mechanisms sensitive to changes in ambient conditions occurring at random times and having varying periods of duration, and made operable thereby to deliver output signals to a controllable device.

PB-231 048/0GA PC$3.25/MF$1.45
Transportation Systems Center, Cambridge, Mass.
INPUT POWER CHARACTERISTICS OF THE THYRISTOR VARIABLE VOLTAGE POWER CONDITIONER.
Final rept. Oct 72-Jun 73,
John J. Stickler, George P. Ploetz, and Frank L. Raposa. Nov 73, 45p DOT-TSC-FRA-73-12 FRA-ORD/D-74-24
See also PB-226 281.

Descriptors: *Electric controllers, Thyristors, Voltage regulation, Speed control, Induction motors, Power supply circuits.
Identifiers: Power conditioners.

A laboratory study was made of transformer and thyristor voltage control for speed control of a rotary induction motor. The test program consisted of two parts; the first dealing with measurements of the induction motor characteristics and the second with the distribution of complex electric power in the system with both types of voltage-control. The current harmonics which are generated by thyristor control are shown to give rise to additional motor losses and reduction in motor efficiency. The non-sinusoidal currents present with thyristor control produce reactive distortion power. Suggestions are made regarding the suitable instrumentation to use in measuring the distortion power as well as the other components of complex power in the system.

9D. Information Theory

AD-776 300/6GA PC$4.75/MF$1.45
Resalab Inc Dallas Tex
IMAGERY COMPRESSION/TRANSMISSION TECHNIQUES.
Final rept.,
Lynn McWaters. Jan 74, 144p* RADC-TR-73-382
Contract F30602-72-C-0342

Descriptors: *Images, *Signal processing, *Fourier transformation, Information theory, Data compression, Entropy, Algorithms.
Identifiers: *Image processing, *Hadamard transformation, Fast Fourier transformation.

The study is a comparison of: Zero Order Predictor, First Order Predictor, Zero Order Interpolator, First Order Interpolator, Delta Modulation, High Information Delta Modulation, Fast Fourier Transform, and Fast Hadamard Transform Image Compression techniques. Comparisons of root mean squared reconstruction error and bit compression ratios are made for each of the techniques. (Author)

AD-776 470/7GA Reprint
Massachusetts Univ Amherst Dept of Electrical and Computer Engineering
THE STRUCTURE OF LEAST-MEAN-SQUARE LINEAR ESTIMATORS FOR SYNCHRONOUS M-ARY SIGNALS.
W. A. Gardner. 15 Oct 72, 6p AFOSR-TR-74-0300
Grant AF-AFOSR-2111-71
Availability: Pub. in IEEE Transactions on Information Theory, vIT-19 n2 p240-243 Mar 73.

Descriptors: *Information theory, *Signal processing, Waveforms, Transfer functions, Correlation techniques.
Identifiers: Intersymbol interference, Parameter estimation.

Several authors have shown that the structure of the least-mean-square linear estimator of the sequence of random amplitudes in a synchronous pulse-amplitude modulated signal that suffer intersymbol interference and additive noise is a matched filter whose output is periodically sampled and passed through a transversal filter (tapped delay line). It is the purpose of the paper to generalize this result to synchronous m-ary signals (e.g., FSK, PSK, PPM signals). (Modified author abstract)

AD-776 594/4GA PC$3.25/MF$1.45
Stanford Univ Calif Stanford Electronics Labs
A HILBERT SPACE APPROACH TO LINEAR PREDICTIVE ANALYSIS OF SPEECH SIGNALS.
Technical rept.,
Madihally J. Narasimha, Kishan Shenoi, and Allen M. Peterson. Feb 74, 41p Rept nos. SU-SEL-74-002, TR-3606-10
Contract N00014-67-A-0112-0044

Descriptors: *Information theory, *Speech recognition, *Hilbert space, Entropy, Coding, Data compression, Recursive functions, Estimates.
Identifiers: Auto correlation.

Linear predictive analysis is geometrically interpreted to provide insight into the various formulations prevalent in current literature. The procedure for obtaining the predictive filter coefficients is considered as a minimum norm problem in an appropriate Hilbert space. Application of the projection theorem using specific sets of bases yields the normal equations for the covariance and autocorrelation methods. Orthogonalization of the basis vectors leads to the popular ladder structure and yields a recursive algorithm for evaluating the predictor and PARCOR coefficients. (Author)

N74-16891/5GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
RECOVERY OF ANALOG SIGNAL SHAPES FROM DISCRETE READINGS.
V. P. Yevdokimov, and L. I. Kolesnikov. Feb 74, 18p NASA-TT-F-15286, PR-134
Contract NASW-2483
Tran-Transl. Into English of "Vosstanovleniye Formy Analogovykh Signalov Po Diskretnym Otschetan", Acad. Of Sci. Ussr, Inst. Of Space Res., Moscow, Report PR-134, 1973 23 p.

Descriptors: *Linear filters, *Signal processing, Analog data, Error analysis, Mathematical models, Signal to noise ratios, Weighting functions.

For abstract, see STAR 1208

9E. Subsystems

AD-776 335/2GA PC$11.00/MF$1.45
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
ON RESOLVING ANGLE AMBIGUITIES OF N-CHANNEL INTERFEROMETER SYSTEMS FOR ARBITRARY ANTENNA ARRANGEMENTS IN A PLANE.
Technical memo.,
James E. Hanson. Oct 73, 159p Rept no. APL-TG-1224
Contract N00017-72-C-4401

Descriptors: *Antenna arrays, *Interferometers, Angles, Topology, Errors, Tolerance.
Identifiers: Ambiguity.

The concept of array ambiguity plot is introduced, and it is shown that there are exactly five distinct topological cases for antennas arranged in a plane. Some examples are given, including all regular polygon arrangements. The remainder of the paper is concentrated on those antenna arrays having a two-dimensional lattice point topology for their array ambiguity plots, as they appear to have the most forgiving tolerance requirements. Angle processing implementation and measurement tolerances for ambiguity resolution are discussed. It is shown that, for a given tolerance and region within which antennas are to be located, the ambiguities of the plot move away exponentially with number of antennas if they are placed judiciously. It is therefore possible to obtain the advantages of wide baseline systems which are ambiguity-free with just a few antennas. The one-dimensional antenna array situation is treated, it being a special case of the theory. (Author)

AD-776 399/8GA PC$4.75/MF$1.45
IIT Research Inst Chicago Ill
EMP RESPONSE OF PARABOLIC REFLECTOR ANTENNAS.
Final rept.,
P. P. Toulios, and Y. Shiau. Dec 73, 138p Rept no. IITRI-E6276
Contract DAAG39-73-C-0189

Descriptors: *Parabolic antennas, Electromagnetic pulses, Response, Satellite communications, Mathematical analysis, Computer programs.

A theoretical investigation was conducted to approximately determine the electromagnetic pulse (EMP) response of Satellite Communications Antenna Systems (SATCOM). The ultimate objective is to be able to estimate system susceptibility to an EMP environment.

AD-776 513/4GA PC$3.25/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
APPLICATION AND DESIGN OF DELAY SYSTEMS WITH CELLS ARRANGED IN TWO TIERS IN FREQUENCY SCAN ANTENNAS.
M. G. Kuznetsov. 7 Dec 73, 41p Rept no. FSTC-HT-23-1724-72
Trans. of Aviatsionnyi Institut, Moscow. Trudy (USSR) n159 p51-85 1964.

Descriptors: *Antenna arrays, *Delay lines, Scanning, Frequency, Losses, Electrical impedance, Mathematical analysis, Translations, USSR.
Identifiers: Design.

The report describes the use of delay systems with cells arranged in two tiers in order to reduce losses in frequency scan antennas. Characteristic features of the systems are presented in detail in the report.

AD-776 542/3GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
TWO-ELEMENT QUADRIFILAR ARRAY,
Frederick R. Domer. 8 Mar 74, 18p Rept no. NRL-7671

Descriptors: *Antenna arrays, Helical antennas, Tracking, Satellite tracking systems, Antenna radiation patterns.
Identifiers: Quadrifilar arrays.

Several quadrifilar helices were built and tested, and a three-quarter-turn, quadrifilar helix was selected for use in a two-element vertical array as a fixed satellite ground antenna. A vertical array of two of the helices was then designed and tested. The pattern provided hemisphere coverage and has a fairly sharp cutoff at the horizon to reduce multipath effects. Impedance measurements, polar patterns, and radiation distribution plots of axial ratio, tilt angle, and polarization loss further verify that this antenna is applicable to satellite tracking. (Author)

AD-776 543/1GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
1200-TO-1300-MHZ 100-WATT TRANSISTOR POWER AMPLIFIER.
Interim rept.,
R. E. Neidert, and H. E. Heddings. 5 Mar 74, 12p Rept no. NRL-7682

Descriptors: *Transistor amplifiers, *Power amplifiers, Microwave equipment, D band, Strip transmission lines, Phased arrays, Transistors.

The report describes the development of a microwave transistor power amplifier having 100-W pulsed output power in the 1200-to-1300-MHz frequency range. The output stage of the amplifier incorporates four microwave power transistors combined with quadrature divided/combine networks. Practical amplifier and microstrip networks problems and solutions are discussed, and amplifier performance data are included. (Author)

AD-776 607/4GA Reprint
Moore School of Electrical Engineering Philadelphia Pa
OPTIMIZATION OF RESPONSIVITY IN MILLIMETER AND SUBMILLIMETER GLOW DISCHARGE DETECTORS,
N. H. Farhat. 1973, 5p AROD-11078.2-E
Grant DA-ARO-D-31-124-73-G74
Availability: Pub. in IEDM Technical Digest, p99-101 1973.

Descriptors: *Microwaves, *Detectors, Discharge tubes, Glow discharges, Theory.

A simplified theory that allows determining optimum gas composition and pressure needed to maximize the responsivity of millimeter and submillimeter glow discharge detectors at a given spectral frequency is presented together with experimental verification. (Author)

AD-776 653/8GA PC$3.25/MF$1.45
Isomet Corp Oakland N J
DEVELOPMENT OF A FLYABLE ACOUSTO-OPTIC LASER BEAM DEFLECTION SYSTEM FOR A HEAD UP DISPLAY OF THE FUTURE.
Final rept. May 72-Aug 73,
Harmon Aronson, and Richard Stolzenberger. 9 Nov 73, 40p Rept no. 074A
Contract N62269-72-C-0439

Descriptors: *Head up displays, Gas lasers, Acoustooptics, Deflectors, Tellurium compounds, Oxides, Laser modulators, Specifications.
Identifiers: *Laser display systems, Helium neon lasers, Tellurium oxide.

The report describes a laser display which is to be used in a Head-Up Display of the future. The uniqueness of the display is that it uses acousto-optic components for the modulation and deflection of the laser beam. As a result, there are no moving parts, which increases the reliability and life expectancy of the equipment. The display uses red light from a He-Ne laser and projects it on a 4 x 4 inch screen with a resolution of 500 x 500 spots (Rayleigh criteria). The system was designed for stroke writing but was demonstrated with lissajous writing. The acousto-optic deflectors employed special features. Two deflectors were used for each axis of scan to eliminate spot focusing and defocusing during scanning. Each deflector used acoustic beam steering to maximize deflection efficiency, maintain deflection uniformity over the deflection range and minimize drive power. (Author)

AD-776 773/4GA PC$4.50/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
LOAD IMPEDANCE CHARACTERISTICS OF TRAPATT OSCILLATORS.
Technical rept.,
Jerry D. Welch. 9 Jul 73, 125p Rept no. TR-496
ESD-TR-73-183
Contract F19628-73-C-0002

Descriptors: *Microwave oscillators, *Avalanche diodes, Electrical impedance, Impedance matching, Computer programs, Theses.
Identifiers: TRAPATT diodes.

A study was made of the impedance required to match the diode in a time-delay-triggered TRAPATT oscillator. The investigation includes both a theoretical analysis and an experimental verification. It provides the most accurate closed-form analysis of TRAPATT oscillator waveforms and efficiencies to date and resolves inconsistencies in the dynamics of the time-delay-triggering processes which have not been adequately explained in previously published analyses. A technique is given for determining the required diode matching impedance and presenting the impedance data in a single set of resistance and reactance curves valid for any fundamental frequency of oscillation. The analysis includes the parasitics of the package and mount and shows that the required matching impedance is strongly influenced by these parasitics; without them the chip itself would be a very broadband device. (Modified author abstract)

AD-776 807/0GA PC$3.75/MF$1.45
Owens-Illinois Inc Toledo Ohio
HIGH RESOLUTION PLASMA DISPLAY TUBE.
Final technical rept. 13 Mar 72-13 Mar 73,
H. Joseph Hoehn, Richard A. Martel, Robert W. Burke, and John W. Miller. Jan 74, 59p RADC-TR-73-402
Contract F30602-72-C-0215

Descriptors: *Display systems, Plasmas(Physics), Gas discharges, Fabrication, Logic circuits, Electrical properties, Optical properties, Brightness, Contrast.
Identifiers: *Plasma display panels, *Flat panel displays, Performance evaluation.

A program to determine the practicality of fabricating and driving plasma display tubes pos-

sessing 1024x1024 (1,048,576) individually addressable elements has been completed. Primary emphasis was given to a study of the processing trade-offs between panel designs of different sizes with line densities from 60 to 100 lines per inch. Analysis of relative difficulties associated with the fabrication of larger panels versus the maintenance of tighter dimensional tolerances required to achieve successful electro/optical operation at higher resolution led to a choice of 83 lines per inch (lines on 12 mil centers) as the most suitable compromise. Processes to produce plasma display tubes with 1024x1024 lines in an active area of 12 1/4 x 12 1/4 inches were developed. Several panels of this size were fabricated and evaluated. (Modified author abstract)

AD-776 810/4GA PC$3.00/MF$1.45
Varian Associates Palo Alto Calif
EFFICIENCY ENHANCEMENT IN MEGAWATT LEVEL BROADBAND MICROWAVE AMPLIFIERS.
Semiannual technical rept. 17 Nov 72-31 May 73,
Robert Butwell. Feb 74, 19p RADC-TR-74-3
Contract F30602-73-C-0073

Descriptors: *Microwave amplifiers, Broadband, Klystrons, Power amplifiers, S band.

The report covers the first six months of effort on a theoretical and experimental investigation of methods of improving the conversion efficiency of relatively broadband linear beam amplifiers operating at a megawatt of peak power. An initial electrical design of an S-band cloverleaf Twystron amplifier has been accomplished. A mechanical layout drawing has been generated. The main cloverleaf circuits have a cold pass band of 18.2% and a minimum hot band interaction impedance of 540 ohms. Beam and circuit parameters were input to the large signal program. The computer predicted performance shows a 10% bandwidth with minimum efficiency of 43%. Predicted band center efficiency is 56%. (Author)

AD-776 811/2GA PC$3.25/MF$1.45
IBM Federal Systems Div Owego N Y Electronics Systems Center
DIELECTRIC MEMBRANE STORAGE DISPLAY TUBE.
Final rept. Jul 72-Jul 73,
Eugene T. Kozol. Feb 74, 42p RADC-TR-74-7
Contract F30602-72-C-0508

Descriptors: *Display systems, *Cathode ray tubes, Storage tubes, Dielectric films, Image tubes, Electron guns, Membranes, Elastomers, Optical properties, Contrast, Brightness, Thermal properties.
Identifiers: Performance evaluation.

The report details a study of the resolution of a dielectric membrane display device. The areas of study included the analysis and selection of a deformable dielectric membrane, incorporation of this membrane into a sealed cathode ray tube, selection and modification of the writing electron gun, and subsequent testing of the complete display device to determine its resolution characteristics. The study results show that the resolution of the device could be increased from 280 to 440 lines per inch, by proper selection of the writing electron gun and the dielectric membrane. (Author)

AD-776 914/4GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
SUMMARY OF RESULTS OF ANTENNA DESIGN COST STUDIES.
J. C. Sureau. 19 Feb 74, 81p Rept no. ATC-22
FAA-RD-74-20
Contracts F19628-73-C-0002, DOT-FA72WAI-261

Descriptors: *Radar antennas, *Air traffic control systems, Radar beacons, Cost analysis, Cost effectiveness.
Identifiers: Design, DABS(Discrete Address Beacon Systems), Discrete address beacon systems.

The Discrete Address Beacon System (DABS) will provide the primary Air Traffic Control (ATC) surveillance information for the 1980-1990 time period as it is introduced gradually as a replacement for the present Air Traffic Control Radar Beacon System (ATCRBS). This report discusses and summarizes the results of two DABS antenna system design-cost trade off studies performed by industrial concerns with substantial design, fabrication and field maintenance experience related to similar antenna systems now in the field. The data from these studies, was to be used to support other Lincoln Laboratory DABS studies leading to the definition and specification of a cost-effective system design.

AD-777 005/0GA PC$3.25/MF$1.45
Hughes Aircraft Co Fullerton Calif Ground Systems Group
VARIABLE PULSE WIDTH MODULATOR (EXPLORATORY DEVELOPMENT MODEL).
Triannual technical rept. 1 Jul-31 Oct 73,
William Scott. Feb 74, 25p ECOM-0267-1-73
Contract DAAB07-73-C-0267

Descriptors: *Modulators, Pulse duration modulation, Variations, Solid state electronics, Electronic switches, Transister amplifiers.

The report provides design and test results achieved from prototype of Driver Amplifier and primary (CPSE) switch elements. Design concepts of the 1000 volt, 25 ampere Basic Switch Element are included, as are circuit areas requiring additional effort. (Modified author abstract)

AD-777 006/8GA PC$3.75/MF$1.45
Microwave Applications Group Chatsworth Calif
MICROWAVE RECIPROCAL LATCHING FERRITE PHASE SHIFTERS.
Semiannual rept. 1 Apr-30 Sep 73,
Charles R. Boyd, Jr. Apr 74, 55p ECOM-0039-2
Contract DAAB07-73-C-0039
See also report dated Jun 73, AD-763 216.

Descriptors: *Phase shift circuits, Ferrites, Microwave equipment, S band, Lithium compounds, Titanium compounds, Impedance matching, C band, Insertion loss.

The report describes continued work of development of an S-band dual-mode reciprocal latching ferrite phase shifter using lithium-titanium ferrite. Particular emphasis is placed on the electronic driver and its interaction with the rf assembly to help stabilize phase shift performance over environmental conditions. Data on driver functions and sequence of operations is presented, as well as rf performance over temperature, and measured loss data up to a peak power level of more than 3.5 Kw. Additional studies of impedance matching have also taken place, and the results are summarized in this report. The main conclusions are that the junction susceptances between ferrite rod and waveguide are very important factors that can influence match. Systematic techniques for adjusting this junction susceptance and for establishing ceramic transformer dimensions have been worked out. Work has also begun on dual-mode phase shifters at C-band. Preliminary results indicate that a unit meeting bandwidth requirements can be met with reasonable ease. Insertion loss results are not as favorable, and it appears that meeting the goal of 1.0 dB loss may be very difficult. (Author)

AD-913 166/9GA PC$4.00/MF$1.45
Naval Electronic Systems Test and Evaluation Facility, St. Inigoes, Md.
VHF ANTENNA COUPLING AND IMPEDANCE MEASUREMENTS.
Final rept.,
C. H. Powell. 13 Sep 73, 11p NESTEF-73-104.3
Distribution Limitation now Removed.

Descriptors: (*Antenna components, Coupling circuits), (*Antennas, Electrical impedance), Very high frequency, Measurement, Attenuators, Spectrum analyzers, Calibration, Power amplifiers, Electric cables, Test sets, Phase(Electronics).
Identifiers: Whip antennas.

Antenna coupling and impedance measurements were performed using two vhf whip antennas in the frequency range from 10 to 100 mhz. The data will be forwarded to ECAC (Electromagnetic Compatibility Analysis Center) for analysis and assimilation into the COSAM (Co-Site analysis Model) program. (Author)

NASA-SP-5964(1) PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C. (Usa).
ELECTRONIC CONTROL CIRCUITS. A COMPILATION.
(nd). 23p

Descriptors: (*Control systems, *Electronic circuits).

For abstract, see NSA 29 07, number 17968.

N74-16953/3GA PC$3.25/MF$1.45
Advisory Group for Aerospace Research and Development, Paris (France).
ROLL PLANE ANALYSIS OF ON-AIRCRAFT ANTENNAS.
W. D. Burnside, R. J. Marhefka, and C. L. Byu. 30 Jan 74, 22p NASA-CR-136815
Contract NGR-36-008-144
Subm-Prepared by Ohio State Univ. Conf-Presented at 26TH Tech. Meeting of the Avionics Panel of AGARD, Munich, Nov. 1973.

Descriptors: *Aircraft antennas, *Antenna radiation patterns, Aircraft models, Flight simulation, High frequencies.

For abstract, see STAR 1208

N74-16956/6GA PC$6.50/MF$1.45
Danish Research Center for Applied Electronics, Hoersholm.
INTEGRATED VOLTAGE REGULATORS: A STUDY OF REGULATION CAPACITIES AND STABILITIES ON 8 TYPES EXPOSED TO VARIOUS ENVIRONMENTS INTEGREREDE SPAENDINGSREGULATORER: EN UNDERSOGELSE AF 8 TYPERS REGULE-RINGSNOJAGTIGHED OG STABILITET UNDER FORSKELLIGE MILJOPAVIRKNINGER.
U. Fabricius. Oct 73, 66p ECR-35
In Danish; English Summary.

Descriptors: *Circuits, *Frequency control, *Voltage regulators, Bypasses, Electrical engineering, Graphs (Charts).

For abstract, see STAR 1208

AD-164 493/9GA PC$4.00/MF$1.45
Department of the Air Force Washington D C
METHOD OF MAKING SUBSTRATES FOR MICROWAVE MICROSTRIP CIRCUITS.
Patent application,
C. H. Lane. Filed 28 Aug 73, 7p Rept no. PAT-APPL-392 378
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Strip transmission lines, Patents, Circuits, Substrates, Microwave equipment, Electric arcs, Plasmas(Physics), Sprays, Fabrication, Encapsulation.
Identifiers: *Patent applications, PAT-CL-29-578.

The patent applicant describes a method using photo resist techniques to apply a microstrip circuit to a soluble or etchable substrate having a thin film conductor on at least one surface. After formation of the circuit, the photo resist is removed,

and the circuit arc-plasma sprayed; subsequently, the original substrate is removed. Another embodiment causes the area from which the original substrate has been removed to be arc-plasma sprayed thereby causing the circuit to be encapsulated. Another embodiment plates the outside surface of the encapsulated circuit to achieve a TEM mode of propagation.

PAT-APPL-424 853 PC$4.00/MF$1.45
Department of Transportation, Washington, D.C.
UNIVERSAL FUNCTION MODULE.
Patent Application,
Lennart E. Long. Filed 14 Dec 73, 11p DOT/Case-TSC-10028
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Modules, *Patent applications, *Printed circuits, Circuits, Fabrication.
Identifiers: *Circuit boards, PAT-CL-174-68-5.

The patent application describes a method of fabricating universal circuit boards which can be used in making up the most common circuit elements, such as amplifiers and the like, to be in turn combined to make up any number of customed design electronic devices.

PATENT-3 369 168 Not available NTIS
Department of the Interior, Washington, D.C.
FREQUENCY CONVERSION SYSTEM UTILIZING MODULATION.
Patent,
Edwin E. Maust, Jr., and Garrett R. Hyde. Filed 5 Aug 66, patented 13 Feb 68, 5p PAT-APPL-570 673, DOCKET/MIN-970
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Frequency converters, *Patents, Modulation, Frequency synthesizers, Discriminators, Transformers.
Identifiers: PAT-CL-321-60.

The patent relates to frequency conversion accomplished by an arrangement of synchronous transformers rotated by a motor drive to modulate the frequency of a standard frequency A-C carrier-current. The modulate carrier is supplied to rectifier and filter circuitry separating this current into positive and negative components from which the carrier is filtered out. The remaining frequency components are combined by switch devices operatively driven in coordination with the transformers, to produce a sine wave output at the modulated frequency.

SLA-73-835 PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
THERMOCOMPRESSION BONDING CAPABILITIES OF METALLIZED TERMINATIONS ON DISCRETE COMPONENTS.
E. L. Chavez. Dec 73, 28p
Contract AT(29-1)-789

Descriptors: (*Wires, *Bonding), (*Printed circuits, Bonding), Compression, Microelectronics, Thermodynamics.

For abstract, see NSA 29 07, number 17970.

9F. Telemetry

N74-16892/3GA PC$12.50/MF$1.45
Operations Research, Inc., Silver Spring, Md.
STUDY OF DATA COLLECTION PLATFORM CONCEPTS: DATA COLLECTION SYSTEM USER REQUIREMENTS.
Final Report.
Apr 73, 190p NASA-CR-132907, TR-769
Contract NAS5-21632

Descriptors: *Data acquisition, *Data collection platforms, *Remote sensors, Information systems, Mathematical models, Quantitative analysis.

For abstract, see STAR 1208

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

COM-74-10479/5GA PC$5.00/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
CONSERVATION VIA EFFECTIVE USE OF ENERGY AT THE POINT OF CONSUMPTION.
Final rept.,
Charles A. Berg. Apr 73, 38p NBSIR-73-202

Descriptors: *Energy, Conservation, Fuel consumption, Buildings, Utilization, Industries.
Identifiers: Energy conservation.

The practices and equipment employed at the point of energy consumption in buildings and in industrial processes permit excessive consumption of energy. It is estimated that if full application of the economically justifiable technical improvements presently available were made to equipment and practices in buildings and industry, as much 25 as percent of the total primary fuel consumption in the U.S.A. could be conserved. The reasons why economically justifiable application of effective technology at the point of energy consumption has not been widely adopted in the past are considered. The needs to facilitate adoption of effective equipment and practices in the future are discussed. (Author)

COM-74-50285/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ENERGY RESEARCH: SCIENTISTS SEEK TO EASE THE PINCH.
Final rept.,
Richard W. Roberts. 1974, 4p
Pub. in the Futurist, v8 n1 p19-22 Feb 74.

Descriptors: *Buildings, *Conservation, *Energy, Scientists, Efficiency, Design.

In this period of energy shortage, intensive research and development efforts are required for the development of viable alternatives to tradional energy sources. During the inevitable lag time between energy need and new supply, conservation measures can do much to reduce the energy gap. This is especially true in buildings, where vast amounts of energy are currently wasted. Various NBS programs bearing on the design and operation of more energy efficient buildings are summarized.

N74-16801/4GA PC$4.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
USING THE ENERGY OF THE WIND FOR ELECTRIFICATION.
V. R. Sektorov. Feb 74, 18p NASA-TT-F-15307
Contract NASW-2482
Tran-Transl. Into English from Elektrichestvo, (Ussr), No. 3 March 1953 p 11-16.

Descriptors: *Agriculture, *Electric power supplies, *Windpowered generators, Electric power plants, Flywheels, Rural areas, Windpower utilization.

For abstract, see STAR 1208

PB-230 248/7GA PC$4.75/MF$1.45
Texas Univ., Austin. Bureau of Economic Geology.
TOWARD A NATIONAL POLICY ON ENERGY RESOURCES AND MINERAL PLANT FOODS.
Special pub.,
Samuel P. Ellison, Jr. 1973, 138p*

Descriptors: *Energy, *Resources, *Plant nutrition, *Government policies, *Meetings, Coal, Oils, Coal gasification, Nuclear energy, Crude oil, Natural gas, Supplies, Minerals, Fertilizers, Solar energy, Forecasting, Sulfur, Phosphate deposits, Potassium carbonates, Conservation, Pollution, Environmental engineering.

A report is made on the first of the university conferences concerning what our national policy should be on oil, gas, coal, nuclear, geothermal, solar sources on energy resources and on all varieties of mineral plant foods. Directions on what policy should be taken on educational endeavor are included.

10B. Power Sources

AD-776 551/4GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
HETEROGENEOUS SOLAR CONVERTERS BASED ON POLYCRYSTALLINE CADMIUM SULFIDE AND SELENIDE,
V. N. Komashchenko, A. I. Marchenko, and G. A. Fedorus. 6 Nov 73, 11p Rept no. FSTC-HT-23-1083-72
Trans. of Poluprovodnikovaya Tekhnika i Mikroelektronika (USSR) n4 p112-121.

Descriptors: *Solar cells, *Semiconductor devices, Cadmium sulfides, Cadmium selenides, Manufacturing, Photoconductivity, Electrical properties, Translations, USSR.

AD-776 734/6GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROSPECTS AND SCIENTIFIC PROBLEMS OF THE APPLICATION OF METHODS OF DIRECT ELECTRICAL POWER ACQUISITION FROM CHEMICAL FUELS,
N. S. Lidorenko, and G. F. Muchnik. 21 Mar 74, 28p Rept no. FTD-MT-24-2-74
Edited machine trans. of Akademiya Nauk SSSR. Izvestiya. Energetika i Transport, n2 p15-27 1973, by Michael L. Seidel.

Descriptors: *Fuel cells, Electric power production, Costs, Reviews, Powers, Electrochemistry, USSR, Translations.
Identifiers: Electrochemical power generation.

The fundamental prospects for the use of electrochemical generators, which convert the chemical energy of fuel into electrical energy are examined. The optimal areas of their application in comparison with other energy sources are determined. Comparisons are conducted for a series of criteria, including technical-economical. A survey is given of the fundamental problems (theoretical, experimental, technical) which appear in the process of creating ECG.

AD-776 982/1GA PC$9.50/MF$1.45
Thermo Electron Corp Waltham Mass
3 KW CLOSED RANKINE-CYCLE POWER-PLANT WITH A TURBINE EXPANDER.
Final rept. 20 Jun 72-2 May 73,
W. Peter Teagan, and Warren Clay. Sep 73, 126p Rept no. TE4165-24-74
Contract DAAK02-72-C-0554

Descriptors: *Gas turbines, *Motor generators, *Rankine cycle, Gearboxes, Heat engines, Feed pumps, Fluorinated hydrocarbons, Thermodynamic cycles, Performance(Engineering).

The report describes the design of a 3 kw generator set driven by an organic Rankine cycle engine. Power is produced with a turbine-gearbox expander arrangement. The turbine speed of 70,200 rpm is geared down internally to the sealed system to 3,600 rpm so that a low speed shaft seal of proven performance can be used to transmit the turbine output to a standard military generator. The system is completely self-contained with con-

trols designed to maintain working fluid cycle conditions and turbine speed constant and independent of load. The system uses an organic working fluid (Fluorinol-85) rather than water to avoid problems associated with freezing and high temperature lubrication. At full load the cycle operates with turbine inlet conditions of 530F and 480 psia and a condensing pressure of 29 psia (202F). (Author)

COM-74-10735/0GA PC$5.50/MF$1.45
Rhode Island Univ., Kingston. Coastal Resources Center.
POWER PLANT SITE CONSIDERATIONS AT CHARLESTOWN, RHODE ISLAND.
Technical rept.,
G. A. Brown, V. C. Rose, S. F. Bartlett, A. Ramano, and R. Gularte. 1974, 48p Marine-TR-23 NOAA-74031107

Descriptors: *Electric power plants, *Site surveys, *Plant location, Planning, Rhode Island, Environmental surveys, Forecasting, Energy, Pollution, Water resources, Land.
Identifiers: Sea Grant programs, Charlestown(Rhode Island).

Some of the aspects of future electrical energy requirements for Rhode Island and New England and criteria for power plant siting were examined. A summary of potential power plant sites is given. Recommendations are included concerning a state organizational structure for dealing with power plant siting and energy management and with industrial siting in general. An appendix presents information on the possiblejuse of the Charlestown Naval Air Station as a power plant site.

JPRS-61359 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
THERMAL CYCLE AND EFFICIENCY OF A VERSATILE POWER UNIT WITH A MAGNETOHYDRODYNAMIC GENERATOR AND THERMOELECTRIC GENERATOR,
V. A. Kirillin, A. E. Sheindlin, E. M. Shelkov, E. V. Shishkov, and S. A. Paahkov. 1 Mar 74, 10p Trans. of Teplofizika Vysokikh Temperatur (USSR) v11 n5 p1088-1091 1973.

Descriptors: *Magnetohydrodynamic generators, Thermoelectric generators, Electric power plants, Efficiency, Translations, USSR.

The reports contains a description of a MHD generator circuit with an overload mode capacity making operation possible in a wide range of loads.

JUL-998-RG PC$4.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorentwicklung.
GESIT: A THERMODYNAMIC PROGRAM FOR SINGLE CYCLE GAS TURBINE PLANTS WITH AND WITHOUT INTERCOOLERS.
J. Heil. Aug 73, 41p
In German. U.S. Sales Only.

Descriptors: (*Gas turbines, *Efficiency), (*Computer codes, *G codes), Cooling, Flowsheets, Heat exchangers, Heat transfer, Htgr type reactors, Mass transfer, Performance, Pressure gradients, Thermodynamic model.

For abstract, see NSA 29 07, number 15474.

N74-16756/0GA PC$3.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
EXPLOITATION OF WIND ENERGY.
H. Christaller. Feb 74, 12p NASA-TT-F-15309
Contract NASW-2482
Trans-Transl. Into English from Elektrizitaetswirtschaft (West Germany), V. 50, No. 11, Nov. 1951 p 320-322.

Descriptors: *Air currents, *Atmospheric turbulence, *Energy sources, *Windpower utilization, *Windpowered generators, Economic factors, Feasibility analysis, Industrial plants, Windmills (Windpowered machines).

For abstract, see STAR 1208

N74-16757/8GA PC$13.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
WIND ENERGY CONVERSION SYSTEMS.
J. M. Savino. Dec 73, 270p NASA-TM-X-69786, NSF/RA/W-73-006
Contract NSF AG-465
Conf-Workshop Proc. Held at Washington, D. C., 11-13 Jun. 1973.

Descriptors: *Electric power supplies, *Energy conversion efficiency, *Energy sources, *Windpower utilization, Cost effectiveness, Energy storage, Windmills (Windpowered machines), Windpowered generators, Windpowered pumps.

For abstract, see STAR 1208

N74-16800/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
H2-O2 COMBUSTION POWERED STEAM-MHD CENTRAL POWER SYSTEMS.
G. R. Seikel, J. M. Smith, and L. D. Nichols. 1974, 14p NASA-TM-X-71512, E-7890
Conf-Presented at Hydrogen Economy Miami Energy Conf., Miami Beach, Fla., 18-20 Mar. 1974; Sponsored by Univ. Of Miami.

Descriptors: *Energy policy, *Hydrogen, *Magnetohydrodynamic generators, *Oxygen, Cost analysis, Electric power transmission, Steam turbines, Systems analysis, Urban planning.

For abstract, see STAR 1208

N74-16802/2GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE ECONOMY AND PRACTICALITY OF LARGE SCALE WIND GENERATION STATIONS (CONCLUSION).
H. Witte. Feb 74, 15p NASA-TT-F-15348
Contract NASW-2483
Trans-Transl. Into English from Elektrotech. Z. (Berlin-Charlottenburg), V. 59, No. 52, 29 Dec. 1938 p 1404-1407.

Descriptors: *Cost analysis, *Electric generators, *Windpower utilization, Feasibility analysis, Frequency control, Systems engineering, Wind velocity, Windpowered generators.

For abstract, see STAR 1208

N74-16803/0GA PC$4.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
A WIND PLANT TO POWER SEA SIGNALS.
F. Baumeister. Feb 74, 17p NASA-TT-F-15356
Contract NASW-2482
Trans-Transl. Into English from Elektrotech. Z. (Berlin-Charlottenburg), V. 7, No. 12, 21 Dec. 1955 p 437-441.

Descriptors: *Buoys, *Lighting equipment, *Water vehicles, *Windpowered generators, Cost effectiveness, Electric power supplies, Navigation aids, Windpower utilization.

For abstract, see STAR 1208

N74-16806/5GA PC$6.50/MF$1.45
General Electric Co., Lynn, Mass. Aircraft Equipment Div.
ACID ELECTROLYTE FUEL CELL TECHNOLOGY PROGRAM.
Final Report, 1 Oct. 1971 - 15 May 1973.
12 Oct 73, 69p NASA-CR-134186, SPR-113
Contract NAS9-12332

Descriptors: *Electrolytes, *Fuel cells, *Space shuttle orbiters, *Spacecraft power supplies, Breadboard models, Electric power supplies, Moisture content, Reactance, Systems engineering.

For abstract, see STAR 1208

N74-16806/3GA PC$9.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
ASDTIC CONTROL AND STANDARDIZED INTERFACE CIRCUITS APPLIED TO BUCK, PARALLEL AND BUCK-BOOST DC TO DC POWER CONVERTERS.
Final Report, Aug. 1971 - Nov. 1972.
A. D. Schoenfeld, and Y. Yu. Feb 73, 128p NASA-CR-121106, TRW-21083-6001-RU-00
Contract NAS3-14392

Descriptors: *Circuit protection, *Direct current, *Power supply circuits, *Voltage regulators, Electric equipment, Equipment specifications, Systems engineering.

For abstract, see STAR 1208

N74-16807/1GA PC$8.00/MF$1.45
Arizona Univ., Tucson. Dept. of Electrical Engineering.
INVERSION LAYER SOLAR CELL FABRICATION AND EVALUATION.
Final Report.
R. L. Call. Sep 73, 95p NASA-CR-136932
Contracts NAS7-100, JPL-953461
Subm-Prepared for JPL.

Descriptors: *Photoelectric cells, *Photosensitivity, *Solar cells, *Solar collectors, Electrical properties, Equipment specifications, Performance tests, Product development.

For abstract, see STAR 1208

N74-17455/8GA PC$4.75/MF$1.45
Paris Univ., Orsay (France). Lab. of Plasma Physics.
TELECOMMAND SUBSYSTEM FOR THE 100 G GENERATOR PRESENTATION DE L'ENSEMBLE DE TELECOMMANDE DE LA GENERATRICE 100 G.
R. Brimaud. Jan 73, 31p LF-8
Language in French.

Descriptors: *Circuit protection, *Command and control, *Impulse generators, *Sequencing, *Systems analysis, Automation, Electrical engineering, High current, High voltages, Remote consoles.

For abstract, see STAR 1208

N74-17456/6GA PC$4.50/MF$1.45
Paris Univ., Orsay (France). Lab. of Plasma Physics.
THEORETICAL AND EXPERIMENTAL STUDY OF THE CURRENT DISTRIBUTION IN COILS COUPLED TO IMPULSE DYNAMOS ETUDE THEORIQUE ET EXPERIMENTALE DES DISTRIBUTIONS DE COURANT DANS LES BOBINES ACCOUPLEES AUX DYNAMOS IMPULSIONNELLES.
B. Geoffrion, and M. Legentil. Mar 73, 29p LF-10
In French; English Summary.

Descriptors: *Electric energy storage, *Energy conversion efficiency, *Impulse generators, *Magnetic coils, Current distribution, Electrical engineering, High voltages, Impedance, Magnetic induction, Time dependence.

For abstract, see STAR 1208

ORNL-tr-2779 PC$3.25/MF$1.45
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine E.V., Koeln (F.R. Germany).

UNDEVELOPED ENERGY RESERVES FOR PRODUCTION OF ELECTRICAL POWER. ATTEMPT AT A REALISTIC METHOD OF CONSIDERATION.
L. F. Franzen, and A. Merton. Sep 72, 23p
Translation by R.G. Mansfield of IRS-S--7.

Descriptors: (*Electric power, *Energy sources), Economics, Fossil fuels, Fusion reactions, Geothermal energy, Hydroelectric power, Nuclear power, Production, Solar energy, Tidal power.

For abstract, see NSA 29 07, number 17910.

PATENT-3 254 202 Not available NTIS
Department of the Interior, Washington, D.C.
AUTOMATIC SWING CURVE CALCULATOR AND PLOTTER USED TO INDICATE TRANSIENT STABILITY OF POWER GENERATORS.
Patent,
Kenneth A. Tuttle. Filed 2 Nov 62, patented 31 May 66, 12p PAT-APPL-235 164, DOCKET/BPA-592
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Simulators, *Patents, Electric generators, Electric power generation, Electric power distribution, Electric power transmission, Surges, Stability, Alternating current, Calculators.
Identifiers: PAT-CL-235-151-21.

The patent relates to a dynamically operated system for simulating particular cooperative relationships between an alternating current power network and means generating power for supplying the network. Automatic recording means made operative in the system produces graphical representations of the transient stability of the power generators when the network is subjected to disturbance conditions.

PATENT-3 259 762 Not available NTIS
Department of the Interior, Washington, D.C.
ELECTROSTATIC INDUCTION POWER SUPPLY.
Patent,
John E. Skuderna. Filed 16 Apr 63, patented 5 Jul 66, 6p PAT-APPL-273 535, DOCKET/REC-601
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Power supplies, *Patents, Electric power transmission, AC generators.
Identifiers: PAT-CL-307-109.

The patent relates to improved devices for supplying low voltage power to auxiliary equipment associated with high voltage power transmission lines.

PATENT-3 465 235 Not available NTIS
Department of the Interior, Washington, D.C.
CONTROL OF ROTATING EXCITERS FOR POWER SYSTEM DAMPING.
Patent,
Ferber R. Schleif, and Glenn E. Martin. Filed 16 Oct 67, patented 2 Sep 69, 7p PAT-APPL-676 013, DOCKET/REC-1212
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric power generation, *Patents, *Limiter circuits, Exciters, Control equipment.
Identifiers: PAT-CL-322-24.

The patent describes rapid damping of power system swing oscillations achieved by controlling generator excitation with signals derived in circuits responsive to frequency deviations of terminal voltage so as to direct the terminal voltage into phase with the oscillations characterizing the frequency deviations.

PB-227 967/7GA PC$3.25/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa.
DRAINAGE SYSTEMS FOR CONDENSATION,
Clarence Zener, and Abrahim Lavi. 1973, 38p* 73-1 NSF-RA/N-73-061, NSF-RANN/SE/GI-39114

Descriptors: *Solar power generation, *Electric power generation, Temperature gradients, Water masses, Condensers(Liquefiers), Surfaces, Heat transmission, Drainage, Design.
Identifiers: Ocean thermal gradient electricity generating systems, Ocean sited power plants.

Efficient condensing surfaces are highly desirable in the design of solar sea power plants using the ocean temperature difference. This paper examines a number of surface designs and presents a convenient method for optimizing the design. (Author)

TID-25036 PC$11.00/MF$1.45
National Bureau of Standards, Boulder, Colo. (Usa).
PROCEEDINGS OF NUCLEAR POWER SYSTEMS CLASSIFIED SESSION, THIRD INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE (IECEC), NATIONAL BUREAU OF STANDARDS, BOULDER, COLORADO, AUGUST 12--16, 1968.
1968, 179p

Descriptors: (*Snap 19 battery, *Radioisotope heat sources), (*Snap 27 battery, *Specifications), (*Thermoelectric generators, Specifications), (*Heat pipes, Specifications), Design, Fabrication, Fast reactors, Meetings, Performance testing, Reentry, Safety, Thermionic converters, Thermionic reactors.

For abstract, see NSA 29 07, number 15440.

10C. Energy Storage

N74-16808/9GA PC$5.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
A STUDY OF DEGRADATION OF PLATES FOR NICKEL-CADMIUM SPACECRAFT CELLS.
Interim Report.
W. R. Scott. Nov 73, 55p NASA-CR-136863, TRW-24118-6001-RU-00
Contracts NAS7-100, JPL-953649
Subm-Prepared for JPL.

Descriptors: *Coining, *Nickel cadmium batteries, Degradation, Life (Durability), Sintering, Spacecraft power supplies.

For abstract, see STAR 1208

11. MATERIALS

N74-17665/2GA PC$16.00/MF$1.45
Purdue Univ., Lafayette, Ind.
MATERIALS SCIENCES RESEARCH.
Progress Report, 1 Oct. 1972 - 30 Sep. 1973.
30 Nov 73, 276p NASA-CR-136819, PR-12
Contracts NSF GH-33574, NSF GH-33574-A1
Subm-Sponsored in Part by NASA.

Descriptors: *Materials tests, *Research projects, *Semiconductors (Materials), *Test facilities, *Transport properties, Chemical properties, Composite materials, Physical properties.

For abstract, see STAR 1208

11A. Adhesives and Seals

PATENT-3 552 754 Not available NTIS
Department of the Interior, Washington, D.C.
TUBE PLATE SEAL.
Patent,
William J. Bow. Filed 15 Sep 69, patented 5 Jan 71, 3p PAT-APPL-861 219, DOCKET/SAL-1589
Previously filed as PAT-APPL-622 813, 13 Mar 67.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Seals(Stoppers), *Patents, Tubes, Boiler tubes, Condenser tubes.
Identifiers: PAT-CL-277-178.

The patent describes a tube to tube plate seal wherein the plate is provided with holes through which the tubes extend, comprising a molded cylindrical resilient insert to be disposed between the tube and tube plate having at one end a radially extending flange engaging a surface of the tube plate, at the other end an inwardly tapered inner surface engaging in outside of the tube, and intermediate the tapered end and flange, a peripheral raised area engaging the plate and holding the insert within the plate hole and the tapered end in sealing engagement with the tube.

11B. Ceramics, Refractories, and Glasses

AD-776 322/0GA PC$4.00/MF$1.45
Rensselaer Polytechnic Inst Troy N Y
TRANSITION METAL IONS AND HETEROGENEOUS NUCLEATION IN GLASS.
Annual rept.,
John Aitken, Deug Moon, Robert K. MacCrone, and Gary Cieloszyk. Jan 74, 79p Rept no. RPI-JBD35-1
Contract N00014-67-A-0117-0017

Descriptors: *Glass, *Amorphous materials, *Iron, *Crystal structure, Transition metals, Electron paramagnetic resonance, Borates, Nucleation, Ferromagnetism.

Magnetization measurements on x Fe2O3 (1-x) (BaO.4B2O3) glasses have been made over the temperature range from 50 mK to 300K for $0 < x < 0.10$. Electron paramagnetic resonance measurements were also made on the same specimens at the temperatures 300 and 77K. These structure sensitive measurements reveal that the majority of the iron ions exist in pairs (diads) and in groups of three, (triads). The isolated Fe(+3) concentration was obtained from the epr g=4.28 resonance. The existence of the triads was inferred from their magnetic susceptibility. This susceptibility was obtained by subtracting the theoretical magnetization of the isolated ions from the total measured value. On the assumption that the triads order at liquid helium temperatures with a resultant moment equal to one of the members, the concentration of isolated Fe(+3) ions as a function of total Fe2O3 content was independently determined, and found to be in quantitative agreement with the epr measurements. (Modified author abstract)

AD-776 403/8GA PC$3.25/MF$1.45
Missouri Univ Rolla Dept of Ceramic Engineering
PROTON-ALKALI ION INTERACTIONS IN GLASS.
Final rept. 15 Feb 73-15 Feb 74,
Delbert E. Day. 15 Feb 74, 32p AROD-11501.1-MC
Grant DA-ARO-D-31-124-73-G120

Descriptors: *Glass, *Protons, *Water, *Internal friction, Damping, Alkali glass, Phosphate glass, Alkali metals, Molecular structure, Fatigue(Mechanics), Mechanical properties.

The present work is concerned with the chemical dissolution of water in glass and its subsequent effect upon properties and molecular structure. The specific objective was to determine whether protons introduced into a glass from chemically dissolved water were responsible for the mechanical damping (internal friction) peaks widely reported in alkali containing glasses. The present work was confined to an examination of glasses of the lowest possible proton (water) content. The glass compositions studied were NaPO3, 33.3 Na2O.66.7 SiO2 and 25 Na2O.75 SiO2, mole percent.

AD-776 448/3GA Reprint
National Bureau of Standards Washington D C Inst for Materials Research
EFFECT OF TEMPERATURE ON THE FRACTURE OF SAPPHIRE,
S. M. Wiederhorn, B. J. Hockey, and D. E. Roberts. 28 Mar 73, 16p
Availability: Pub. in Philosophical Magazine, v28 n4 p783-796 Oct 73.

Descriptors: *Sapphire, *Fracture(Mechanics), Alumina, Plastic deformation, Crack propagation, Temperature.

At low temperatures, metastable crack growth dictates the environment free strength of sapphire. Plastic deformation by dislocation motion or twin formation and growth plays no role in the fracture process at temperatures below 400C. These conclusions are supported both by crack growth studies and critical stress intensity factor measurements on sapphire crystals, and by transmission electron microscopy studies of arrested cracks in sapphire and alumina. (Author)

AD-776 454/1GA PC$3.75/MF$1.45
TRW Systems Group Redondo Beach Calif
HOLOGRAPHIC CHARACTERIZATION OF CERAMICS. PART IV. (MEASUREMENT OF SURFACE ROUGHNESS ON SI3N4 BEARING SURFACES).
Final rept.,
T. V. Roszhart. 1973, 69p*

Descriptors: *Silicon nitrides, *Ceramic materials, *Bearings, *Holography, *Nondestructive testing, *Surface roughness, Lasers, Coherent optical radiation, Quality control, Surface properties, Finishes, Wear.
Identifiers: Coherent surface analysis.

A method for measuring the surface roughness of ceramic bearings was developed using coherent light techniques. The method is noncontacting and nondestructive and is applicable to cylindrical (and spherical) surface geometries. Surface roughnesses varying from 193 microinches to 9.46 microinches (A.A.) were measured in the longitudinal and circumferential directions on typical Si3N4 bearing specimens. This technique, referred to as Coherent Surface Analysis, determines surface roughness by analyzing the scattering of a laser beam from random surfaces. Since the laser beam can be scanned over the entire surface, it is possible to measure point to point variations in roughness. This feature was used to measure the change in surface roughness caused by rolling contact fatigue. (Author)

AD-776 544/9GA PC$4.50/MF$1.45
Michigan Univ Ann Arbor Dept of Materials and Metallurgical Engineering
GLASSY CARBONS.
Semi-annual progress rept. 30 Jun 73-1 Jan 74,
Edward E. Hucke. Jan 74, 109p Rept no. UMICH-010199
Contract DAHC15-71-C-0283, ARPA Order-1824
See also reprt AD-763 499.

Descriptors: *Carbon, Glass, Furan resins, Pyrolysis, Porosity, Crystal structure, High temperature, Compressive properties, Electrical resistance.
Identifiers: *Glassy carbon, Vitreous state.

Porous glassy carbons achieved by pyrolysis of flurfural alcohol resins can reproducibly and rapidly be produced in large sections with tailored properties of potential interest for mechanical, physical and chemical applications. Sections greater than three inches have been made in pyrolysis cycles of one day. Thermodynamic cell measurements of the configurational enthalpy and entropy difference between glassy carbons and graphite have shown that the fine structures of various glassy carbons are quite different and certainly not merely microcrystalline graphite. Small angle X-ray scattering measurements under improved experimental conditions have shown excellent agreement with other such work on commercial glassy carbon samples. A rather strong inverse relation exists between the compressive strength and electrical resistivity, reduced by calculation to eliminate all pores open to xylene, indicating that better layer perfection leads to higher strength. (Modified author abstract)

AD-776 964/9GA PC$3.00/MF$1.45
IIT Research Inst Chicago Ill
FABRICATION OF HARD GLASS PLATES.
Final rept.,
M. Akbar Ali, and A. Zeev Hed. Jan 74, 20p
AMMRC-CTR-74-13
Contract DAAG46-73-C-0150

Descriptors: *Glass, *Plates, *Hardness, Fabrication, Density, Formulations, Optical properties.
Identifiers: Transparent armor.

This report describes the fabrication of hard glass for use in ballistic application. The work consisted of establishing optimum composition and process conditions for several different glasses. Properties such as Knoop hardness, density, flexural strength, Young's modulus, visible transmission and percent haze were determined. A beryllia containing glass having an apparent hardness of approximately 900 Knoop (density = 2.56 gram/cc) was selected for ballistic testing and thirty-two 4-inch diameter discs were fabricated for this purpose. (Author)

AERE-R-7539 PC$3.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
IRRADIATION EFFECTS IN CERAMICS.
J. R. Matthews, and P. E. Potter. Sep 73, 16p
CONF-730972-1
U.S. Sales Only.

Descriptors: (*Ceramics, *Physical radiation effects), Fast neutrons, Neutron beams, Swelling.

For abstract, see NSA 29 07, number 16120.

COM-74-50154/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FAILURE PREDICTION IN STRUCTURAL CERAMICS USING ACOUSTIC EMISSION.
Final rept.,
A. G. Evans, and M. Linzer. 1973, 7p
Pub. in Jnl. of the American Ceramic Society, v56 n11 p575-581 Nov 73.

Descriptors: *Ceramics, Fractures(Materials), *Acoustic detectors, Crack propagation, Predictions.

Crack propagation in a typical structural ceramic (porcelain) is accompanied by acoustic emission. Two types of emission are detected. The first type is caused by slow growth of the fracture-initiating flaw; the emission rate depends primarily on crack velocity. Failure prediction using this source of emission can be effective, however, only if low-level emission, which may be related exclusively to crack growth, can be detected. The second source of emission, which occurs during bulk stressing, is the cracking associated with second-phase particles (quartz particles in porcelain) as a result of the combined action of the applied stress and local thermal and mechanical stresses. An analysis for predicting emission rates is developed and forms the basis for using this source of acoustic emission in failure prediction.

GERHTR-61 PC$3.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany).
IRRADIATION INDUCED CHANGES OF THERMAL EXPANSION (C.T.E.) OF NUCLEAR GRAPHITE.
W. Delle. 1971, 8p

Descriptors: (*Graphite, *Physical radiation effects), Cracks, Crystals, Grain size, High temperature, Medium temperature, Neutron beams, Neutrons, Temperature dependence, Thermal expansion.

For abstract, see NSA 29 07, number 16365.

PATENT-2 934 443 Not available NTIS
Department of the Interior, Washington, D.C.
IMPACT RESISTANT CERAMIC DIELECTRIC AND METHOD OF MAKING SAME.
Patent,
Haskiel R. Shell, and Jay E. Comeforo. Filed 10 Oct 57, patented 26 Apr 60, 5p PAT-APPL-689 458, DOCKET/MIN-237
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ceramics, *Dielectrics, *Patents, Inorganic silicates, Lead inorganic compounds, Potassium silicates, Aluminum silicates, Glass, Fibers, Crystallization, Impact strength.
Identifiers: PAT-CL-106-39.

The objects of the patent are: (1) a ceramic having superior impact resistance in comparison to the ceramics presently available; (2) a ceramic having good resistance to thermal shock and excellent electrical insulating properties; (3) a ceramic dielectric having high absorption for short wave radiation such as gamma rays, or X-rays; (4) a method for producing ceramics composed of a fibrous synthetic mineral, alone, or in admixture with a glass, where the composition of the glass may be the same or different from the fibrous material.

11C. Coating, Colorants, and Finishes

AD-776 416/0GA PC$3.75/MF$1.45
Pratt and Whitney Aircraft West Palm Beach Fla Florida Research and Development Center
RESEARCH FOR ENGINE DEMONSTRATION OF EROSION-RESISTANT COATING EFFECTIVENESS.
Final rept.,
Charles C. McComas, and Larry S. Sokol. Mar 74, 64p Rept no. PWA-FR-6186 AMMRC-CTR-74-9
Contract DAAG46-73-C-0249

Descriptors: *Coatings, *Titanium alloys, *Nickel, Titanium compounds, Adhesion, Fatigue(Mechanics), Gas turbines, Aluminum alloys, Molybdenum alloys, Vanadium alloys.
Identifiers: Titanium carbonitrides, Titanium alloy 8Al 1Mo 1V, Titanium alloy 6Al 4V.

The objectives of this program were to optimize the electroless nickel-plating procedure (PWATM 36) for titanium alloys (Ti-8Al-1Mo-1V and Ti-6Al-4V) to provide a more uniform underlayer for the TIKOTE-C erosion-resistant coating system. TIKOTE-C is a proprietary titanium carbonitride coating. The PWA 36 electroless-nickel promised to provide a more uniform and less expensive underlayer for the TIKOTE-C, with greater adhesion to titanium and less fatigue strength reduction than the multiple layer electroless nickel, electrolytic-nickel combination previously used. The approach to the program was first to optimize the PWA 36 electroless nickel process parameters on both the Ti alloys to achieve maximum adhesion and minimum loss of fatigue strength. Metallographic examination of the coating disclosed uniform nickel and TIKOTE-C layers with clean, void-free bond lines at the titanium-nickel and nickel-TIKOTE-C interfaces. Tensile adhesion values were greater than those obtained with other nickel underlayers. (Modified author abstract)

AD-776 884/9GA PC$3.00/MF$1.45
Army Natick Labs Mass Clothing and Personal Life Support Equipment Lab

THE RESPONSE OF AIRCRAFT CAMOUFLAGE LACQUERS TO THERMAL RADIATION. PART II. 6000 DEGREES K RADIATOR AND 800 FT/SEC AIR FLOW,
Earl T. Waldron. Nov 73, 22p Rept no. C/PLSEL-116 USA-NLABS-TR-74-12-CE

Descriptors: *Lacquers, *Camouflage, *Aircraft, *Thermal radiation, Tests, Wind tunnels, Aluminum alloys, Panels, Air flow, Weapons, Temperature, Measurement, Photography, Optical properties.
Identifiers: Aluminum alloy 7075.

Three colors of each of two lacquers on aluminum panels were exposed to radiation simulating that from 100 KT and 1 MT weapons, while air at a velocity of 800 ft/sec flowed across the exposed surface of the panels. Differences in the response of the lacquer-color combinations were observed, temperatures at the rear surface of the panels were measured, and an expression relating response to weapon size was derived. (Author)

AD-777 028/2GA PC$3.75/MF$1.45
Goodyear Tire and Rubber Co Akron Ohio
STUDIES OF DETERIORATION OF COATINGS FOR COLLAPSIBLE FUEL TANKS.
Final rept. Jul 73-Mar 74,
Thomas W. Chalmers. Mar 74, 53p
Contract DAAK02-74-C-0011

Descriptors: *Fuel tanks, *Coatings, *Tropical regions, Polyurethane resins, Deterioration, Ultraviolet radiation, Humidity, Stresses, Ozone, Elastomers, Tests, Diesel fuels, Gasoline.

The report describes the accomplishments under a program to determine the causes for the excessive deterioration of flexible tank coatings due to the combined exposure to ultraviolet radiation, high humidity, stress, fuel and ozone. A second objective was to develop specification tests and requirements which will preclude this type of deterioration. A number of deterioration tests were performed on five different types of flexible fuel tank coating materials. In order to perform these tests, improved apparatus and procedures were developed for exposing the specimens to simulated service exposure conditions. The most deteriorating test was the one combining the effects of temperature, ultraviolet radiation, combat gas and high humidity. The polyether rubber retained the greatest amount of its original physical properties after this test. However, it had the greatest volume swell which could cause adhesive problems in fabricated fuel tanks. (Modified author abstract)

N74-17286/7GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EVALUATION OF COMMERCIALLY SUPPLIED SILVER COATED TEFLON FOR SPACECRAFT TEMPERATURE CONTROL USAGE.
J. B. Heaney. Jan 74, 35p NASA-TM-X-70588, X-765-74-24

Descriptors: *Spacecraft structures, *Teflon (Trademark), *Thermal control coatings, Bonding, Inconel (Trademark), Irradiation, Performance tests, Silver.

For abstract, see STAR 1208

N74-17287/5GA PC$8.75/MF$1.45
TRW, Inc., Cleveland, Ohio. Materials Technology.
ENVIRONMENTAL PROTECTION TO 922K (1200 F) FOR TITANIUM ALLOYS.
Final Report.
M. T. Groves. Nov 73, 112p NASA-CR-134537, ER-7704
Contract NAS3-14339

Descriptors: *High temperature environments, *Thermal control coatings, *Titanium alloys, Aluminum, Erosion, Impact tests, Oxidation resistance, Salt spray tests, Silicides, Stress corrosion.

For abstract, see STAR 1208

N74-17293/3GA PC$4.75/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Automatique.
METHODOLOGY CONCERNING THE SIMULATION OF IONIZING RADIATIONS WITH SPECIAL REFERENCE TO COATINGS WHEN IN GEOSTATIONARY ORBIT.
J. Bourrieau, A. Paillous, J. Philippon, J. Giacomoni, and A. Ziliani. 1973, 32p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Electron irradiation, *Proton irradiation, *Space environment simulation, *Synchronous satellites, *Thermal control coatings, Particle energy, Particle flux density, Radiation damage, Symphonie satellites.

For abstract, see STAR 1208

PAT-APPL-374 731 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
WHEY SOLIDS AS A STABILIZER FOR AGRICULTURAL FOAMS.
Patent Application,
Madeline G. Lambou, and James J. Spadaro. Filed 28 Jun 73, 16p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Foam, Farm crops, Stability, Thickeners(Materials), Surfactants, Viscosity, Utilization, Carriers, Frost protection.
Identifiers: *Whey, PAT-CL-252-8-05, *Agricultural farms.

In the patent application, highly economical agricultural foams have been prepared from selected formulations containing whey solids, a surfactant, and a viscosity builder. These foams are light in weight, that is, of high expansion, and reasonably wet which make them specifically useful as carriers for defoliants, herbicides, fungicides and sterilants. They are also useful in protecting row crops from frost damage.

PATENT-3 236 682 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR PREPARATION OF CAUSTIC-RESISTANT CONTAINERS FOR HIGH-TEMPERATURE USE.
Patent,
Lee N. Ballard, and Willis A. Calhoun. Filed 28 Dec 62, patented 22 Feb 66, 2p PAT-APPL-248 160, DOCKET/MIN-599
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Crucibles, *Protective coatings, *Patents, Nickel, Iron oxides, Calcium oxides, Alkalies, Slurries, Drying.
Identifiers: PAT-CL-117-127.

The patent discloses a method for preparing a coated nickel reaction vessel resistant to caustic materials at high temperature. It comprises coating the nickel vessel with an aqueous slurry of a mixture of ferric oxide in a major amount, an alkaline earth metal oxide and an alkali metal hydroxide; and drying and calcining the coated vessel to form a caustic resistant coating thereon.

PATENT-3 681 099 Not available NTIS
Department of Agriculture, Washington, D.C.
GLOSSY FINISH LINSEED WATER EMULSION PAINTS AND NONAGGLOMERATED PIGMENT COMPOSITION FOR SAID PAINTS.
Patent,
Lambertus H. Princen. Filed 4 Aug 70, patented 1 Aug 72, 5p PAT-APPL-61 252,
Previously filed as PAT-APPL-705 316, 14 Feb 68.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Paints, *Linseed oil, *Emulsification, Shelf life, Oxides, Pigments, Fungus resistant coatings, Gloss, Emulsions, Titanium dioxide, Zinc oxides.
Identifiers: PAT-CL-106-254.

The patent describes stable aqueous emulsion linseed oil housepaints that dry to nonflat, i.e. semigloss or highly glossy finishes. They are produced by dispersing metallic oxide pigment(s) in low boiling solvent containing emulsifiers and sufficient linseed oil to fully coat the unaggregated pigment particles, and the resulting dispersion or suspension is then gently emulsified in water. Evaporation of the low boiling solvent followed by the incorporation of additional oil provides the improved aqueous linseed emulsion paint of the invention.

PATENT-3 784 499 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NONFLAMMABLE COATING COMPOSITIONS.
Patent.
A. C. Krupnick, C. F. Key, and R. J. Harwell.
Patented 8 Jan 74, 4p NASA-CASE-MFS-20486-2, Misc-Filed 26 Sep. 1972. Subm-Continuation-in-Part of Abandoned US Patent Appl. Sn-84212, Filed 26 Oct. 1970.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Oxygen, *Protective coatings, *Spacecraft cabin atmospheres, Acrylic resins, Aqueous solutions, Metal coatings, Mica, Nonflammable materials, Optical properties, *Patents.

Nonflammable coating compositions are described for use in high-oxygen environments which include an aqueous suspension of synthetic mica, an alkali metal silicate gelant and a waterbase latex resin emulsion. Inorganic white and/or color pigments and additives such as glass microballoons are employed to provide a wide range of colors and optical properties.

11D. Composite Materials

AD-776 296/6GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
MOVING LOAD ON A LAMINATED COMPOSITE.
Rept. for Jul-Nov 73,
Charles Sve, and George Herrmann. 31 Dec 73, 28p Rept no. TR-0074(4240-10)-9 SAMSO-TR-74-65
Contract F04701-73-C-0074

Descriptors: *Composite materials, *Dynamic loads, *Laminates, Numerical analysis, Shock waves.

A solution is presented for the dynamic response of a periodically laminated half plane that consists of alternating layers of two different materials and is subjected to a moving load. The laminations are parallel to the surface of the half plane, and the velocity of the load is steady and supersonic. An effective stiffness theory developed by Sun, Achenbach, and Herrmann is used to model the layered material, and the formal solution is obtained with the aid of Laplace transforms. A far-field solution is constructed with the head-of-the-pulse procedure, and several numerical examples are presented. (Author)

AD-776 328/7GA PC$3.75/MF$1.45
Watervliet Arsenal N Y
TORSIONAL FATIGUE BEHAVIOR OF GRAPHITE-EPOXY CYLINDERS.
Master's thesis,
Robert R. Fujczak. Mar 74, 52p Rept no. WVT-TR-74006

Descriptors: *Fiber reinforced composites, *Graphite, *Epoxy resins, *Fatigue(Mechanics), Torsion, Cylindrical bodies, Shear properties, Strain(Mechanics), Orientation(Direction), Theses.
Identifiers: *Carbon fiber reinforced plastics, Graphite reinforced composites, Epoxy matrix composites.

The effects of fiber orientation on torsional fatigue life were studied for graphite-epoxy cylinders. The fiber orientations used were parallel to the longitudinal cylindrical axis and at angles of plus or minus 45 degrees to the axis. Torsional stresses for the plus or minus 45 degree tubes at equivalent numbers of failure cycles were almost 4 times as high as those for longitudinal tubes. A plot of shear strain vs. fatigue cycles indicated that shear strain is a more sensitive parameter to describe fatigue life than torsional stress in cylinders. Also, shear strain of cylinders at any given time during fatigue indicates the remaining life of the component independent of the fiber orientation. (Modified author abstract)

AD-776 346/9GA PC$6.75/MF$1.45
Watervliet Arsenal N Y
DEVELOPMENT OF HIGH STRENGTH FILAMENT REINFORCED SUPERALLOY COMPOSITES.
Technical rept.,
I. Ahmad, W. J. Hefferman, J. M. Barranco, F. Saegusa, and R. Haskell. Mar 74, 74p Rept no. WVT-TR-74005

Descriptors: *Composite materials, Superalloys, Reinforcing materials, Filaments, Matrix materials, High strength, Cobalt alloys, Tungsten alloys, Tantalum compounds, Carbides, Chemical vapor deposition, Casting, Fabrication, Jet engines.
Identifiers: Cobalt alloy Mar M-322, Cobalt alloy Mar M-302, Tungsten alloy 1ThO2.

The report describes the progress made during FY 73 on the subject project, the objective of which is to develop high strength filament (tungsten alloys and silicon carbide) reifnroced superalloy composites with a rupture life of 100 hours under 30 ksi at 2000F. Fy 73 work has resulted in the application of investment casting to the fabrication of cobalt base composites containing W-1%ThO2 and SiC filaments. Feasibility of the casting of a vane was also demonstrated.

AD-776 402/0GA PC$3.75/MF$1.45
Brown Univ Providence R I Div of Applied Mathematics
AN EXPERIMENTAL INVESTIGATION OF STRESS WAVES IN RODS OF A FIBER-REINFORCED COMPOSITE.
Technical rept.,
Peter J. Arseneaux, Jr. Jun 73, 68p Rept no. TR-21 AROD-5606.18-E
Contract DA-31-124-ARO(D)-358

Descriptors: *Glass reinforced plastics, *Fiber reinforced composites, *Stresses, Wave propagation, Rods, Anisotropy, Elastic properties, Fibers, Alignment.
Identifiers: Epoxy matrix composites.

The propagation of pulses in square bars of glass-epoxy fiber reinforced material was observed experimentally. The fiber orientation was varied from parallel to perpendicular to the bar's axis. Phase velocities were compared with those predicted from taking an effective Young's modulus for the bar. Geometric dispersion was considered by examining sinusodial vibrations of composite rods of circular cross-section. Dispersion curves were predicted based on a lateral inertia correction and measured using a resonance method. The experimental results are not very extensive but nevertheless sufficient for qualitative conclusions to be advanced. Damping measurements were taken from oscilloscope records of free oscillations of the round composite rods. (Modified author abstract)

AD-776 409/5GA PC$3.75/MF$1.45
Tel-Aviv Univ (Israel) School of Engineering
ON WAVE PROPAGATION IN MATERIALS REINFORCED WITH BI-DIRECTIONAL FIBERS.
Final rept. (Part 2) Jul 72-Jul 73,
Yechiel Weitsman, and Yako Benveniste. Jul 73, 68p
Contract DAJA37-73-C-0400
See also Final rept. (Part 1), AD-768 408.

Descriptors: *Fiber reinforced composites, Stresses, Wave propagation, Elastic properties, Fibers, Alignment, Numerical analysis, Israel.

The report presents the results of an investigation of the propagation of plane harmonic elastic waves in composite materials that are reinforced with straight bi-directional fibers. The fibers were assumed to be extensible as well as inextensible. Expressions are given for slowness surfaces, group velocities, energy fluxes, stresses and displacements. All these quantities are related to the material properties, fiber direction and the direction of propagation. Several reflection-refraction problems are solved and discussed. In those problems the authors considered two semi-infinite media bonded at a plane interface. Those media are identical in all respects except for fiber directions. It is shown that changes in fiber directions have a crucial influence on the forward progress of the wave energy. (Modified author abstract)

AD-776 412/9GA PC$3.00/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
HIGH STRENGTH EUTECTIC COMPOSITES.
Final rept. 1 Jan 71-31 Mar 74,
Alfred S. Yue. 31 Mar 74, 6p AROD-9447.6-MC
Grant DA-ARO-D-31-124-73-G94

Descriptors: *Fiber reinforced composites, *Titanium alloys, *Germanium alloys, Compressive properties, Tensile properties, Creep, Fracture(Mechanics), Eutectics, Zone melting.
Identifiers: Titanium matrix composites, Titanium germanides.

Fiberlike Ti-Ti5Ge3 eutectic composites were produced by electron-beam floating zone-melting. The volume fraction of the germanide fiber in the Ti-Ti5Ge3 eutectic mixtures was increased from 19.5 to 34% in agreement with theoretical predictions. The effects of freezing rate and temperature on the mechanical properties of the Ti Ti5Ge3 eutectic composites was investigated. It was found that the room temperature compression strength and tensile modulus were 325,000 psi and 26.5 x 10 to the sixth power psi. At temperatures less than 400C the average tensile strength was 160,000 psi. These properties were superior to any known commercial titanium alloys. The creep and fracture behaviors of these eutectic composites were studied as functions of freezing rate and temperature. In general, these behaviors were in good agreement with those reported from artificially-made fiber-reinforced metal matrix composites. (Modified author abstract)

AD-776 414/5GA PC$6.00/MF$1.45
Georgia Inst of Tech Atlanta School of Ceramic Engineering
METAL-GROWN OXIDE-METAL COMPOSITES.
Final technical rept. 10 Jun 71-31 Dec 73,
Alan T. Chapman, James F. Benzel, J. K. Cochran, Robert K. Feeney, and F. W. Ling. Dec 73, 235p* Rept no. E18-604-6
Contract DAAH01-71-C-1046, ARPA Order-1637
See also AD-759 507.

Descriptors: *Fiber reinforced composites, *Ceramic materials, *Field emission, Metals, Fibers, Oxides, Uranium compounds, Cerium compounds, Gadolinium compounds, Tungsten, Molybdenum, Refractory metals, Solidification, Electron emission, Rare earth compounds.
Identifiers: Eutectic compositions, Metal fibers, Cerium oxides, Uranium oxides, Gadolinium oxides, Neodymium oxides, Lanthanum oxides.

The research program was designed to develop melt-grown oxide-metal composite structures for high field electron emission testing. A variety of refractory oxide-metal mixtures (i.e. UO2-W, stabilized ZrO2 and HfO2-W, UO2-Ta, and the rare earth oxides of Gd2O3, Nd2O3 and La2O3-Mo and W) were successfully induction melted and unidirectionally solidified to form aligned metallic fibers embedded in the oxide matrix. Metal solubility in the molten oxides, control of the oxide stoichiometry and metal volatility were shown to be significant parameters controlling the successful composite growth in these systems. Emission measurements were performed with a variety of unusual emitter geometries, including metallic coated samples and structures designed to operate at low voltages (< 100V). Analysis of post-emission damage and emission performance were used to assess the probable failure mechanism limiting the current density and life of the oxide-metal cathode structures. (Modified author abstract)

AD-776 439/2GA Reprint
Tel-Aviv Univ (Israel) School of Engineering
IMPACT-DEFLECTION BY OBLIQUE FIBERS IN SPARSELY REINFORCED COMPOSITES,
Jacob Aboudi, and Yechiel Weitsman. 21 Mar 72, 19p AFOSR-TR-74-0337
Grant AF-AFOSR-2143-71
Text in English; attached summaries in English and German.
Availability: Pub. in Jnl. of Applied Mathematics and Physics (ZAMP), v23 p328-344 1972.

Descriptors: *Fiber reinforced composites, *Dynamic loads, Anisotropy, Fibers, Orientation(Direction), Israel.

A matrix sparsely reinforced by fibers is investigated under the assumption that the rigidity of the fibers is greater than that of the matrix. Constitutive equations are given in terms of the reinforcement ratio and angles of inclination of the fibers. Specifically, the problem of a reinforced half-space suddenly impacted on its surface by a time-dependent concentrated force is solved by a stable numerical procedure. Results are given for various reinforcements and fiber directions. Comparisons with the isotropic case are shown. (Author)

AD-776 591/0GA PC$3.75/MF$1.45
Monsanto Research Corp St Louis Mo
MOLDING OF ORIENTED SHORT-FIBER COMPOSITES. II. FLOW THROUGH CONVERGENT CHANNELS,
Lloyd A. Goettler. Mar 74, 53p Rept no. HPC-70-130
Contract N00014-67-C-0218, ARPA Order-876
Report on Monsanto/Washington Univ., ONR/ARPA Association Project Development of High Performance Composites. See also report dated Dec 72, AD-754 763.

Descriptors: *Fiber reinforced composites, *Molding, Epoxy resins, Fiberglass, Alignment, Fluid flow, Viscosity, Tensile properties.
Identifiers: *Oriented fiber composites, Transfer molding.

Superior mechanical properties can be attained in a short fiber composite by using the flow in transfer or injection molding to align the fibers into the direction of highest stress. This is best accomplished in an elongational flow field, such as

occurs in a converging channel. A model is derived to describe the changes in orientation distribution resulting from this flow. The author investigated the effects of the geometric, material, and processing variables on the orientation parameters of this model, the resulting orientation level and the tensile modulus of molded rods. (Author)

AD-776 592/8GA PC$3.75/MF$1.45
Monsanto Research Corp St Louis Mo
THE EFFECTS OF THICK INTERFACES ON THE MECHANICAL PERFORMANCE OF FIBER REINFORCED COMPOSITES,
R. E. Lavengood, M. J. Michno, and J. D. Fairing. Mar 74, 57p Rept no. HPC-72-158
Contract N00014-67-C-0218, ARPA Order-876
Report on Monsanto/Washington Univ./ONR/ARPA Association. Project Development of High Performance Composites.

Descriptors: *Fiber reinforced composites, *Plastic coatings, *Boron, *Fiberglass, Fibers, Epoxy resins, Interfaces, Fatigue(Mechanics), Shear strength, Water, Transverse, Fiberglass reinforced plastics.
Identifiers: Boron reinforced composites.

Techniques are described which permit the application of very uniform thin epoxy coatings on boron or 5 mil diameter glass fiber. These thick interfaces improve the transverse strength and interlaminar shear strength of glass/epoxy composites by as much as 60% and 35% improvements are typical for boron/epoxy composites. Flexural and torsional fatigue strengths of both materials are improved by 1 to 3 orders of magnitude. The resistance of composites to boiling water is also dramatically improved. After a 2 hour boil, thick interface samples retain more than 80% of their original transverse strength while control samples retain only 65 to 75%. (Author)

AD-776 753/6GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STRESSED-STRAINED STATE OF CYLINDRICAL SHELL OF FIBER-GLASS-REINFORCED PLASTIC UNDER INFLUENCE OF LOCAL LOAD,
Yu. P. Armyukhin, Yu. P. Zhigalko, and G. M. Salnikov. 7 Mar 74, 27p Rept no. FTD-HT-23-360-74
Edited trans. of Issledovaniya po Teorii Plastin in Obolochek (USSR) n8 p256-271 1972, by Marilyn Olaechea.

Descriptors: *Fiber reinforced composites, *Stress strain relations, Shells(Structural forms), Cylindrical bodies, Loads(Forces), Numerical analysis, Translations, USSR.
Identifiers: *Cylindrical shells.

The article studies the stressed-strained state of an orthotropic cylindrical shell made of a material which is slightly resistant to transverse shear. Formulas describing the stressed-strained state of the shell are obtained.

AD-776 756/9GA PC$17.50/MF$1.45
Grumman Aerospace Corp Bethpage N Y
REPAIR TECHNOLOGY FOR BORON/EPOXY COMPOSITES.
Final technical rept. Feb 69-30 Apr 71,
G. Lubin. Feb 72, 289p AFML-TR-71-270
Contract F33615-69-C-1498

Descriptors: *Composite materials, *Repair, Boron, Epoxy compounds, Epoxy resins, Matrix materials, Airframes, Aircraft, Sandwich panels, Airplane panels, Honeycomb structures, Damage.
Identifiers: Boron reinforced plastics, Epoxy matrix composites.

The primary objective of this program was to fully characterize a repair technology for first-generation boron/epoxy composite aircraft structure with particular emphasis on empennage components. The program included the fabrication and quality assurance of plain, stiffened, and honeycomb sandwich panels designed for loading intensities up to 20,000 pounds per inch. These structures were then damaged by ballistic and foreign object impact, lightning strike, and production conditions. The damage was assessed, repaired, and evaluated by both destructive and non-destructive testing. Effective repair procedures were optimized and tested under various loading and environmental conditions to establish the criteria needed for the development of universal repair. The repair techniques were summarized in a repair manual for both field and depot usage. The requisite fabrication and quality control methodology was established for the selected repair and a complete repair kit which requires only an external power source was provided. Finally, a motion picture training film was provided describing the developed repair technology. (Author)

AD-776 793/2GA PC$3.25/MF$1.45
TRW Inc Cleveland Ohio
PROPERTIES AND FRACTURE MODES OF BORSIC-TITANIUM.
Technical rept. Jun 71-Mar 72,
Brent R. Collins, W. D. Brentnall, and I. J. Toth. Dec 72, 40p AFML-TR-73-43
Contract F33615-71-C-1044

Descriptors: *Fiber reinforced composites, *Titanium alloys, *Silicon carbides, *Boron, Aluminum alloys, Vanadium alloys, Fracture(Mechanics), Fabrication, Tensile strength, Transverse, Bonding, Temperature.
Identifiers: Titanium matrix composites, Borsic fibers, Titanium alloy 6Al 4V.

Borsic(SiC coated B fibers)/Ti-6Al-4V composites have been successfully fabricated using the full reinforcement potential of the filaments. Multiple filament breaks were found to occur prior to longitudinal composite failure and hence improvements in the filament strength distribution would suggest improvement in tensile strength. Transverse failure was found to be limited by failure of the interface, filament splitting and inadequate interlaminar bonding. Improved control of the filament spacing would therefore give rise to improved transverse strengths. The temperature dependence of the longitudinal strength is similar to that of the filaments showing a reduction in in situ filament strength. The transverse tensile strength is nearly independent of temperature indicating a limiting mechanism also relatively independent of temperature. This is shown to be predominately interface failure with some fiber splitting. The properties and simplicity of the system have been shown to make Borsic/Ti-6Al-4V a potentially superior composite material with a wide range of applications. (Modified author abstract)

AD-776 822/9GA PC$5.00/MF$1.45
Rand Corp Santa Monica Calif
HIGH-PERFORMANCE COMPOSITE MATERIALS FOR VEHICLE CONSTRUCTION: A FINITE ELEMENT COMPUTER PROGRAM FOR THE ELASTOPLASTIC ANALYSIS OF CRACK PROPAGATION IN A UNIDIRECTIONAL COMPOSITE,
Tiina Repnau, and Donald F. Adams. Oct 73, 158p* Rept no. R-1392-PR
Contract F44620-73-C-0011

Descriptors: *Computer programs, *Fiber reinforced composites, Crack propagation, Stress strain relations, Elastic properties, Data processing, Reinforced plastics, Transverse, FORTRAN.
Identifiers: Metal matrix composites, Finite element analysis, FORTRAN 4 programming language.

Structural materials composed of stiff filaments embedded in a plastic matrix--e.g., a boron-aluminum composite--have very high compressive strength per unit weight, but their performance is limited by a resistance to transverse loading that is no greater than that found in conventional materials. A step toward predicting the strength of composite materials is the numerical model and computer program of crack initiation and propagation under transverse normal loading, documented here. Based on the tangent modulus, finite element method of elastoplastic analysis, the FORTRAN IV program models material failure of the type that has been observed in composite materials, where microscopic cracks develop at the matrix-filament boundary and propagate throughout the matrix. (Modified author abstract)

AD-776 974/8GA PC$5.25/MF$1.45
Artech Corp Falls Church Va
RESEARCH AND EXPLORATORY DEVELOPMENT ON THE FABRICATION AND CHARACTERIZATION OF FIBER REINFORCED LIGHT METAL ALLOY COMPOSITES.
Final rept. Apr 72-Dec 73,
P. J. Lare, Robert A. Hermann, and Henry Hahn. Jan 74, 42p Rept no. J7118-FR
Contract N00017-72-C-4311

Descriptors: *Fiber reinforced composites, *Whisker composites, *Aluminum alloys, *Titanium alloys, Silicon carbides, Carbon fibers, Vanadium alloys, Sintering, Tensile properties, Fibers, Alignment.
Identifiers: Silicon carbide reinforced composites, Aluminum matrix composites, Titanium matrix composites, Carbon reinforced composites, Aluminum alloy 2024, Aluminum alloy 7178, Titanium alloy 10V.

Discontinuous beta-SiC whiskers and chopped C filaments were used as a reinforcement for strengthening 7178 and 2024 Al alloys. The C fibers were coated with Cu to improve wetting. Tensile properties of a 25 v/o beta-SiC 2024 Al composite were increased three times over the matrix strength at room temperature and ten times at 800F. Tensile properties in the transverse direction were at least equal to the matrix strength at temperatures up to 800F. Ti-10V composites reinforced with SiC filaments were consolidated by activated pressure sintering. The samples produced were not fully dense. Consolidation temperature or time at temperature could not be increased since the reaction between the matrix and filaments would be too severe.

AD-776 979/7GA PC$14.25/MF$1.45
Effects Technology Inc Santa Barbara Calif
STRESS WAVE RESPONSE OF CARBON COMPOSITE MATERIALS.
Final rept. 12 May 72-11 Sep 73,
Floyd R. Tuler, Marlyn E. Graham, and Mark A. Ferdman. Jan 74, 225p AMMRC-CTR-74-2
Contract DAAG46-72-C-0135

Descriptors: *Composite materials, Carbon phenolic materials, Carbon, Carbon fibers, Graphite, Matrix materials, Stress wave, Response, Shock waves.
Identifiers: Carbon reinforced composites, Carbon matrix composites, Graphite reinforced composites.

The stress wave response and damage was examined in two dimensionally (2D) reinforced carbon phenolic and carbon carbon composite materials and a three dimensionally (3D) reinforced carbon carbon composite material. The 2D carbon phenolic composite material was fabricated to represent the matrix of 3D composites investigated in a previous program, and the 2D carbon carbon was fabricated to represent the matrix of the 3D carbon carbon. Average stress wave attenuation was determined using front surface and in-material carbon composition piezoresistive gages. In addition, high magnification streak photography was used to measure the micromechanical response of the fiber bundle and interfiber matrix regions of the 3D carbon carbon. For each material, the stress wave damage modes and levels were characterized visually and microscopi-

cally and property degradation was determined in dynamic threelpoint bending. (Modified author abstract)

COM-74-50268/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Mechanics Div.
TENSILE BEHAVIOR OF BORON/EPOXY-REINFORCED 7075-T6 ALUMINUM ALLOY AT ELEVATED TEMPERATURES.
Final rept.,
Daniel J. Chwirut, and George F. Sushinsky. Mar 74, 31p NBS-TN-812
Contract NASA-L-43554
Paper copy available from GPO $0.65 as C13.46:812.

Descriptors: *Composite materials, *Sandwich laminates, Aluminum alloys, Epoxy resins, Boron, Fabrication, Tension tests, Reinforced plastics, Sandwich construction, Loads(Forces), Deformation, Stress strain diagrams.
Identifiers: Aluminum alloy 7075, Boron reinforced plastics.

Static tensile tests were performed on specimens of 7075-T6 aluminum alloy, 0 deg unidirectional boron/epoxy, and 7075-T6 aluminum alloy reinforced on the surface with 0 deg unidirectional boron/epoxy laminate, at four temperatures up to 300F (149C). Analytical load-strain curves are formulated for the reinforced-metal specimens using the rule of mixtures, assuming that the longitudinal strains in the composite and the metal remain equal, and taking account of the residual stresses caused by the fabrication process. Two analytical curves are plotted for each reinforced-metal specimen, one based on the measured ply thickness of the composite, and one based on a nominal 0.005-in (0.13-mm) ply thickness. In general, the experimental load-strain curves fall between the two analytical curves for each specimen. (Author)

N74-17250/3GA PC$5.75/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
COMPOSITE MATERIALS. SILICON CARBIDE REINFORCED ALUMINUM MATERIAUX COMPOSITES ALUMINIUM CARBURE DE SILICIUM RAPPORT FINAL.
Final Report.
1972, 53p REPT-6-466
Contract DRME-70/488
Language in French.

Descriptors: *Aluminum, *Fluid injection, *Laminates, *Reinforcing fibers, *Silicon carbides, Alloys, Coatings, Fracture strength, Manufacturing, Mechanical properties, Modulus of elasticity, Nondestructive tests, Rupturing, Temperature effects.

For abstract, see STAR 1208

N74-17296/6GA PC$21.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugmechanik.
REVIEW OF APPLICATION OF GLASS FIBER REINFORCED PLASTICS IN RESEARCH AND DEVELOPMENT PROJECTS FINANCED BY THE GERMAN BUNDESMINISTERIUM DER VERTEIDIGUNG AND BUNDESAMT FUER WEHRTECHNIK UND BESCHAFFUNG UEBERSICHTSBERICHT UEBER DIE VERWENDUNG GLASFASERVERSTAERKTER KUNSTSTOFFE (GFK) BEIVOM BMVG UND BWB FINANZIERTEN FORSCHUNGS-UND ENTWICKLUNGSVORHABEN.
H. Wolff. 1973, 366p BMVG-FBWT-73-17
Subm-Sponsored by X Bundesmin. Fuer Verteidigung.

Descriptors: *Bibliographies, *Glass fiber reinforced plastics, *Materials tests, *Research and development, *Research projects, Aircraft structures, Germany, Product development, Ships, Surface vehicles, Weapons.

For abstract, see STAR 1208

N74-17672/8GA PC$12.75/MF$1.45
Ecole Nationale Superieure de Mecanique, Nantes (France).
ANNALS 1972, SECOND TERM ANNALES 1972, DEUXIEME SEMESTRE.
1972, 195p
Language in French.

Descriptors: *Composite materials, *Kalmanschmidt filtering, *Kossel pattern, *Thin films, Dielectric properties, Linear prediction, Real time operation, Self adaptive control systems, Single crystals.

For abstract, see STAR 1208

PAT-APPL-276 211 PC$4.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
GLASS POLYMER COMPOSITES.
Patent Application,
Meyer Steinberg, Peter Colombo, and Gerald Farber. Filed 28 Jul 72, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Glass particle composites, *Filled thermoplastics, *Sewer pipes, *Patent applications, Filled molding materials, Polymethyl methacrylate, Manufacturing.
Identifiers: PAT-CL-106.

The patent application describes a glass polymer composite and a method of preparing same consisting of crushed glass with a mixture of sizes to obtain minimum void volume impregnated with monomer which is polymerized in situ. Certain construction materials such as sewer pipe and exterior wall facings made from this material are illustrative.

PATENT-2 829 061 Not available NTIS
Department of the Interior, Washington, D.C.
MACHINABLE CERAMIC BONDED MATERIAL AND METHOD FOR PRODUCING SAME.
Patent,
Jay E. Comeforo, and Robert A. Hatch. Filed 24 Sep 52, patented 1 Apr 58, 3p PAT-APPL-311 338,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Filled composites, *Patents, Ceramic materials, Mica, Fillers, Hot pressing, Casting, Machinability, Bonding.
Identifiers: PAT-CL-106-39.

The patent relates to a machinable material capable of withstanding high temperatures and resistant to wear and to thermal-shock. It comprises filler material bonded within a matrix of synthetic fluorine-mica, and to a method for producing such material.

11E. Fibers and Textiles

PAT-APPL-272 824 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
FIRE AND WRINKLE RESISTANT ORGANIC TEXTILES THROUGH TREATMENT WITH A METHYLOL PHOSPHINE AND AN AZIRIDINYL PHOSPHORUS COMPOUND.
Patent Application,
George L. Drake, Jr., John V. Veninate, Donald J. Daigle, Wilson A. Reeves, and Darrell J. Donaldson. Filed 18 Jul 72, 13p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Textile finishing, *Phosphines, *Aziridines, Cotton fabrics, Flameproofing, Durable press treating, Fire resistant textiles, Shrinkproofing, Polymers, Organic phosphorus compounds, Phosphine oxides, Rotproofing, Impregnating, Polymerization.
Identifiers: PAT-CL-8-116.

The patent application describes the production of fire and wrinkle resistant organic textiles through treatment with a methylol phosphine and an aziridinyl phosphorus compound. Methylol phosphines, methylol phosphine in combination with amine or amido compounds, or water soluble adducts of these methylol phosphines with amides or amines, when mixed and reacted with aziridine phosphine oxides or sulfides containing at least one 1-aziridinyl group attached to phosphorus, are particularly valuable for the preparation of thermosetting flame resistant polymers. The polymer solutions are also valuable for the preparation of flame-, glow-, wrinkle-, and shrink-resistant textiles by impregnating fabrics with these solutions and causing reaction and polymer formation by application of heat.

PAT-APPL-274 949 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
A DEHYDRATION PROCESS TO IMPART WRINKLE RESISTANCE TO CELLULOSE-CONTAINING FIBROUS MATERIALS.
Patent Application,
Russel M. H. Kullman, and Robert M. Reinhardt. Filed 25 Jul 72, 18p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Crosslinking, *Durable press treating, *Dehydration, Cellulose, Impregnating, Curing, Cotton fabrics.
Identifiers: PAT-CL-8-116-P.

The patent application relates to a process for chemical finishing of cellulose-containing fibrous materials to effect crosslinking and improvement in wrinkle resistance. Crosslinking formulations are applied to cotton and other cellulose-containing textiles and made to react by dehydrating the impregnated textile at ambient temperatures and pressures.

PAT-APPL-279 919 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PREPARATION OF CROSSLINKED POLYETHYLENIMINE AND IMPREGNATION OF CELLULOSIC MATERIAL WITH IN SITU CROSSLINK-POLYMERIZED ETHYLENIMINE.
Patent Application,
Earl J. Roberts, and Stanley P. Rowland. Filed 11 Aug 72, 11p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Textile processes, *Ion exchange resins, *Patent applications, Aziridines, Ethylene resins, Halocarbon resins, Polymerization, Metals, Impregnation, Water treatment, Crosslinking, Halogen organic compounds, Rotproofing.
Identifiers: PAT-CL-8-120, Water pollution control.

In the patent application cotton and other fibrous material is impregnated with ethylenimine prepolymer prepared by reacting ethylenimine and certain di- and polyfunctional alkyl or aryl halide to produce an insoluble in situ formed network polymer which is physically bound in the structure of the substrate used. This new material is an excellent scavenger of heavy metals in water. This material can be prepared to be simultaneously low in ion-exchange capacity while being high in capacity for complexing with heavy metals.

PAT-APPL-288 806 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
METHOD OF INCREASING COVERING POWER OF KNITTED COTTON FABRIC.
Patent Application,

John G. Frick, Jr., and Gloria A. Gautreaux. Filed 13 Sep 72, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cotton fabrics, *Opacity, *Textile finishing, *Patent applications, Ureas, Alcohols, Crosslinking, Cellulose.
Identifiers: PAT-CL-8-100.

In the patent application yarns in knitted cotton or other cellulosic fabric are subjected to modification of cross-sectional dimensions through the use of press rollers and are immediately thereafter crosslinked thereby durably increasing the covering power (as measured by air-permeability) and/or the opacity of the treated fabric.

PAT-APPL-298 167 PC$4.75/MF$1.45
Department of Agriculture, Washington, D.C.
RECURABLE CROSSLINKED CELLULOSE FABRICS FROM METHYLOL REAGENTS AND POLYCARBOXYLIC ACIDS.
Patent Application,
William E. Franklin, and Stanley P. Rowland.
Filed 16 Oct 72, 34p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Durable press treating, *Patent applications, Polybasic organic acids, Crosslinking, Ureas, Cotton fabrics, Cellulose, Alcohols.
Identifiers: PAT-CL-8-120.

In the patent application cellulosic fabrics are treated with formulations containing methylol crosslinking reagents and polycarboxylic acids having three or more acidic groups per molecule. The treated fabrics are cured in a flat configuration and washed. The fabric is subsequently heated in a folded configuration whereby the folded or creased configuration is permanently imparted to the fabric. A metal salt activating catalyst included in the formulation of the textile treating solution decreases the time required to form sharp, permanent creases in the cured fabrics.

PAT-APPL-306 774 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PRODUCTION OF PHOSPHORUS AND NITROGEN CONTAINING COMPOUNDS AND POLYMERS AND FLAMEPROOFING ORGANIC TEXTILES.
Patent Application,
Wilson A. Reeves, Darrell J. Donaldson, Donald J. Daigle, George L. Drake, Jr., and John V. Beninate. Filed 15 Nov 72, 14p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Flameproofing, *Patent applications, Polymers, Phosphines, Phosphorus organic compounds, Nitrogen organic compounds, Addition resins, Alcohols.
Identifiers: PAT-CL-260-932, Methanol/phosphinidynetri.

In the patent application soluble methylol phosphine adducts which contain one or more methylol phosphine radicals (PCH_2OH) are prepared by reacting in a suitable solvent tris(hydroxymethyl)phosphine with an amide or amine which contains one or more hydrogens attached to trivalent nitrogen. These soluble adducts are particularly valuable for the preparation of thermosetting flame resistant polymers by reacting them with nitrogenous compounds which contain two or more hydrogen and methylol groups attached to trivalent nitrogen. The adducts are also valuable for the preparation of flame-, glow-, wrinkle-, and shrink-resistant knit and woven textiles by causing the adducts to react with nitrogenous compounds in or on the textile structure by application of heat.

PAT-APPL-324 136 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
FLAMEPROOFING OF COTTON CELLULOSE WITH HEXAMETHYL PHOSPHOROUS TRIAMIDE.
Patent Application,
Leon H. Chance, and Armand B. Pepperman, Jr.
Filed 16 Mar 73, 15p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Flameproofing, *Patent applications, Phosphorus organic compounds, Nitrogen organic compounds, Cotton fabrics, Cellulose, Cation exchanging.
Identifiers: PAT-CL-8-100, Phosphorous triamide/hexamethyl.

In the patent application hexamethyl phosphorous triamide is reacted with cotton cellulose, thereby imparting flame retardancy and cation-exchange properties to the cellulose.

PAT-APPL-328 199 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
SHRINKAGE-CONTROL TREATMENT FOR KNITED FABRICS.
Patent Application,
Gerald B. Verburg, John G. Frick, Jr., and John D. Reid. Filed 31 Jan 73, 15p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Knitted fabrics, *Shrinkproofing, Crosslinking, Urea resins, Durable press treating, Cotton fabrics.
Identifiers: PAT-CL-8-100.

The patent application relates to the process of producing knitted cotton or cotton and synthetic fabrics that have substantially reduced shrinkage on laundering without causing severe losses of fabric dimensions to the manufacturer. Resistance to dimensional change in laundering has been attained by inducing shrinkage through a wet or dry agitation after treatment with crosslinking agents.

PAT-APPL-342 133 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
MODIFICATION OF COTTON TEXTILES AND COTTON/POLYESTER TEXTILE BLENDS BY PHOTO-INITIATED POLYMERIZATION OF VINYLIC MONOMERS.
Patent Application,
Alden H. Reine, Jett C. Arthur, Jr., and Norman A. Portnoy. Filed 16 Mar 73, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Cotton fabrics, *Impregnating, Vinyl resins, Polyacrylamides, Textile finishing, Physical properties, Photochemical reactions, Polymerization, Dyeing, Moisture regain.
Identifiers: *Photopolymerization, PAT-CL-8-116-200.

This invention relates to a method of modifying cotton and/or cotton-polyester fabric blends by durably depositing select polymers on and within the yarns and fibers of the textile substrate to change the physical properties of the cellulosic textiles. Fabrics are impregnated with aqueous solutions of certain water-soluble monomers and each treated fabric subsequently exposed to near-ultraviolet light thereby initiating polymerization of the monomer on and/or within the yarn and fiber structure. The resulting textiles have improved physical and chemical properties, among which are dye-receptivity, moisture-regain, and personal comfort.

PAT-APPL-348 555 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
UNIFORM PLANAR STRAIN TESTER.
Patent Application,
Charles B. Hassenboehler. Filed 6 Apr 73, 11p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Tensile testers, *Patent applications, Strains.
Identifiers: PAT-CL-73-95.

This patent application relates to an apparatus for stretching a textile material such that the magnitude of the strain at all points in the plane is equal in all directions in the plane of the specimen. The embodiment disclosed is an expandable circular pin frame. The pins mounted in pulleys are uniformly displaced radially outward and impart uniform radial strain without the edge effects associated with similar apparatuses employing nonexpanding fastening mechanisms.

PAT-APPL-348 558 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
COTTON-OXIME, COTTON-SEMICARBAZONE, AND COTTON-HYDANTOIN-TEXTILE PRODUCTS OF HIGH NITROGEN CONTENT.
Patent Application,
Norman A. Portnoy, Alden H. Reine, and Jett C. Arthur, Jr. Filed 6 Apr 73, 10p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cotton fabrics, *Flameproofing, *Patent applications, Vinyl resins, Nitrogen organic compounds, Ketones, Polymerization, Oximes, Hydantoins.
Identifiers: PAT-CL-116-200, Semicarbazones, Graft polymerization.

In the patent application, poly(methyl vinyl ketone)-cotton copolymers are prepared by graft copolymerization and subsequently reacted through abundant ketone groups thereby producing new cotton-oximes, cotton-semicarbazones, and cotton-hydantoins. The chemical modifications of the cotton textile products are permanent, thereby permanently modifying the mechanism and rate of oxidation of cotton as desired in flame-resistant cotton textile products.

PAT-APPL-351 935 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
INTRODUCTION OF A TEMPORARY STIFFNESS INTO KNITTED COTTON FOR STABILITY DURING PATTERNING.
Patent Application,
John G. Frick, Jr., Bethlehem K. Andrews, and Gloria A. Gautreaux. Filed 17 Apr 73, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cotton fabrics, *Textile finishing, *Patent applications, Stiffening, Durable press treating, Sizing(Surface treatment), Nitrogen organic compounds, Ureas, Carbamates, Alcohols.
Identifiers: PAT-CL-8-100.

In the patent application, knitted cotton fabrics for durable-press textile products are given a temporary stability and stiffness by spray application of a stabilizing or firming agent after application of the durable-press finishing agent. The added stability and stiffness allow the fabric to be cut more easily into patterns for the textile product, but, because they are temporary, do not affect adversely the stiffness or feel of the final product.

PAT-APPL-360 281 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
AZEOTROPIC SOLVENTS FOR PERMANENT PRESS TREATMENTS OF COTTON AND COTTON BLEND FABRICS.
Patent Application,
Ralph J. Berni, Ruth R. Benerito, Elwood J. Gonzales, and Linda L. Muller. Filed 14 May 73, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cotton fabrics, *Durable press treating, *Patent applications, Ureas, Crosslinking, Solvents, Alcohols, Dioxanes.
Identifiers: PAT-CL-8-120.

The patent application comprises the treatment of cellulosic textiles in the presence of a Lewis acid catalyst with N-methylolated ureas dissolved in azeotropes of water and any of a selected group of solvents including isopropyl alcohol, n-butyl alcohol, t-butyl alcohol, n-propyl alcohol, or dioxane. The cellulosic products thus modified have high dry and wet wrinkle recovery and the solvent used can be reclaimed with a minimum expenditure of energy as compared to all-aqueous treatments.

PAT-APPL-365 894 PC$4.25/MF$1.45
Department of Agriculture, Washington, D.C.
A PROCESS FOR DYEING CROSSLINKED CELLULOSIC FABRICS WITH DISPERSE DYESTUFFS.
Patent Application,
Robert J. Harper, Jr., Eugene J. Blanchard, John T. Lofton, and Gloria A. Gautreaux. Filed 1 Jun 73, 24p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Textile finishing, *Patent applications, Dyeing, Cellulose, Crosslinking, Cotton fabrics, Ureas, Polyurethane resins, Masking.
Identifiers: PAT-CL-8-100.

The patent application consists of the treatment of a fabric with crosslinking agent and a suitable polymer. This was followed by dyeing the fabric with a disperse dyestuff. The latter is important because it permits blended fabrics to be dyed with a single class of dye under relatively mild conditions.

PAT-APPL-365 895 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PROCESS FOR PRODUCING FIRE RESISTANT ORGANIC TEXTILE MATERIALS.
Patent Application,
Darrell J. Donaldson, Floyd L. Normand, George L. Drake, Jr., and Wilson A. Reeves. Filed 1 Jun 73, 10p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Flameproofing, *Patent applications, Vinyl resins, Bromine organic compounds, Alcohols, Antimony oxides, Tin oxides, Alcohols.
Identifiers: PAT-CL-116-P, Polyvinyl bromide.

In the patent application organic fibrous materials especially cellulosic and other textiles are rendered flame resistant upon treatment with an emulsion containing either (1) an organic bromine containing material having at least 65% bromine such as polyvinylbromide, (2) polyvinylbromide and an N-methylol agent such as trimethylolmethylglycoluril, (3) polyvinylbromide and a metal oxide such as antimony oxide, and (4) polyvinylbromide, N-methylol agent and metal oxide. The treated textiles, including polyester/cotton blends remain highly flame resistant through innumerable laundry cycles.

PAT-APPL-365 896 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
FLAME RETARDANT ORGANIC FIBROUS MATERIALS.
Patent Application,
Darrell J. Donaldson, Floyd L. Normand, George L. Drake, Jr., and Wilson A. Reeves. Filed 1 Jun 73, 17p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Flameproofing, *Patent applications, Phosphorus organic compounds, Amides, Sodium phosphates, Emulsions, Bromine organic compounds, Polymers.
Identifiers: PAT-CL-8-116-P, Phosphonium compounds.

In the patent application organic fibrous materials especially cellulosic and other textiles are rendered flame resistant upon treatment with an emulsion containing (1) a tetrakis(hydroxymethyl)phosphonium salt, (2) an amide, (3) a salt of a strong base and a weak acid such as disodium hydrogen phosphate, and (4) an organic bromine containing polymeric material having at least 65% bromine.

PAT-APPL-365 897 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PROCESS FOR PREPARING FROSTED AND MULTICOLORED COTTON PILE FABRICS.
Patent Application,
Robert J. Harper, Jr., Eugene J. Blanchard, and Gloria A. Gautreaux. Filed 1 Jun 73, 18p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cotton fabrics, *Textile finishing, *Patent applications, Dyeing, Towels, Cellulose, Ureas, Crosslinking.
Identifiers: PAT-CL-8-100.

The patent application relates to a process for producing frosted and multicolored cotton pile fabrics by means of finishing techniques. For this purpose, procedures to permit selective blocking and dyeing of specified regions of the fabric have been developed.

PAT-APPL-371 642 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
SOLVENT VAPOR FIBERSET PROCESS FOR DURABLE PRESS FINISHING OF CELLULOSIC FABRICS.
Patent Application,
Norton A. Cashen, Robert M. Reinhardt, and John D. Reid. Filed 20 Jun 73, 20p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Durable press treating, *Patent applications, Chlorohydrocarbons, Vinyl chloride, Cellulose.
Identifiers: PAT-CL-260-326-300.

In the patent application durable press properties are imparted to cellulosic textiles by use of this 'FIBERSET' process. Polymer fixation is carried out in the vapor of a boiling organic solvent. Single and two-step variations of the process can be employed to fit the specific end goals. The finished goods have good strength, abrasion resistance, and durable-press properties.

PAT-APPL-374 585 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PROCESSES TO MAKE OLIVE DRAB TO GREENISH-GOLD MINERAL DYE SHADES FOR CELLULOSICS.
Patent Application,
Charles J. Conner. Filed 28 Jun 73, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Dyeing, *Patent applications, Cellulose, Iron sulfate, Chromium inorganic compounds, Chlorides, Shading(Colors).
Identifiers: PAT-CL-8-52, Chromium chlorides.

In the patent application, olive drab to greenish-gold mineral dye shades are imparted to cellulosic textiles by a two-solution aqueous process wherein critical proportions of ferrous salts and chromic chloride are mixed in a first aqueous solution, applied to the textile and dried, then a mixture of sodium hydroxide and sodium carbonate are applied in a second aqueous solution, and the color developed upon the drying-curing step. The coloration is controllably olive drab when the ferrous salt content is low and controllably greenish-gold when the ferrous salt content is high.

PAT-APPL-391 188 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PROCESS FOR PRODUCING VARICOLORED FABRICS VIA THE SELECTIVE DYEING OF CELLULOSIC FABRICS WITH DIFFERENT DYE TYPES.
Patent Application,
Robert J. Harper Jr., Eugene J. Blanchard, John T. Lofton, and Gloria A. Gautreaux. Filed 24 Aug 73, 17p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Textile finishing, *Patent applications, Dyeing, Cellulose, Cotton fabrics, Polyurethane resins, Polyacrylates, Ureas, Crosslinking, Acrylonitrile copolymers, Masking.
Identifiers: PAT-CL-8-100.

This patent application consists of coating a fabric either entirely on one side, in a selected area, as a stripe, or in another design. The design may also be painted or printed on the fabric. The coating solution contains either a polymer or polmer and crosslinking agent. The fabric is then dyed with a disperse dye and a cotton dye. The polymer treated part of the fabric is dyed with the disperse dye while the remainder of the fabric is dyed with the cotton dye. By this technique, fabrics were produced which were one color on one side and another color on the other, or which have stripes or designs on the fabric.

PATENT-3 696 600 Not available NTIS
Department of Agriculture, Washington, D.C.
APPARATUS FOR PRODUCING CORE YARN.
Patent,
Mayer Mayer, Jr., James I. Kotter, Harold L. Salaun, Jr., and Roger S. Brown. Filed 12 Apr 71, patented 10 Oct 72, 12p PAT-APPL-132 953,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Yarns, *Core yarns, Cotton, Machinery.
Identifiers: PAT-CL-57-5.

This invention relates to a process for the continuous formation of various types of core yarn by the use of electrostatic, physical and chemical means. More specifically, it relates to a process for electrostatically, peripherally surfacing or sheathing a coring yarn with individual fibers and means for treating the coring yarn with a crosslinking chemical formulation to permanently set the yarn configuration.

PATENT-3 732 073 Not available NTIS
Department of Agriculture, Washington, D.C.
N,N-DIETHYLAZIRIDINIUM CHLORIDE AS A COREACTANT CATALYST FOR REACTIONS OF N-METHYLOL REAGENTS WITH CELLULOSE.
Patent,
Stanley P. Rowland, Earl J. Roberts, and Clinton P. Wade. Filed 28 Mar 72, patented 8 May 73, 6p PAT-APPL-238 869,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Catalysts, *Textile finishing, *Carbinols, Crosslinking, Cotton fabrics, Aziridines, Ureas, Melamines, Durable press treating.
Identifiers: *Aziridinium compounds, PAT-CL-8-183, Aziridinium chloride/N-N-diethyl.

The patent concerns N,N-diethylaziridinium chloride (DAC) which is a coreactant catalyst for the reaction of cellulose with a broad variety of N-methylol compounds. The DAC was found especially effective as delayed-cure crosslinking processes on cotton.

11F. Metallurgy and Metallography

AD-776 327/9GA PC$4.25/MF$1.45
Watervliet Arsenal N Y
THE COMPRESSION AND TENSILE YIELD BEHAVIOR OF A COLD WORKED HIGH STRENGTH STEEL.
Technical rept.,
Joseph J. Pepe. Feb 74, 25p Rept no. WVT-TR-74004

Descriptors: *Steel, *High strength alloys, *Cold working, Extrusion, Compressive properties, Tensile properties, Yield strength, Stress strain relations.
Identifiers: Bauschinger effect.

A low alloy, quench and tempered high strength steel was cold worked various amounts up to 70% reduction in area by hydrostatic extrusion. The compressive offset yield strength of the cold worked material was significantly lowered due to the Bauschinger effect. These data were compared to the tensile yield behavior of this material similarly cold worked and indicated that the Bauschinger effect also altered the tensile yield behavior. With successively higher post-extrusion heat-treatments the Bauschinger effect was found to become smaller and could eventually be eliminated. The strength differential between the compression and tensile yield strengths of the unworked material disappeared after cold hydrostatic extrusion and post-extrusion tempering at 1000F. (Author)

AD-776 394/9GA PC$3.25/MF$1.45
Battelle Columbus Labs Ohio
DETERMINATION OF THE FEASIBILITY OF USING BETA RADIATION BACKSCATTER FOR THE DETECTION OF SURFACE CONTAMINATION OF METAL PANELS.
Technical rept.,
H. Thomas Gruber, Elmer J. Bradbury, Carl W. Melton, and Merle L. Rhoten. 15 Mar 74, 41p
USAAVSCOM-TR-73-31
Contract DAAJ01-73-C-0858

Descriptors: *Beta ray spectroscopy, *Surfaces, *Impurities, Titanium, Honeycomb structures, Panels, Aluminum, Bonding, Pickling, Heat treatment.

The beta backscatter technique was determined to be feasible for the measurement of contaminants and surface preparation coatings. Titanium and aluminum honeycomb panels with bonded and disbonded areas were examined to identify (1) contaminants or surface preparation properties which result in disbonding and (2) surface preparation coatings which result in acceptable bonds. The poor bonding of the titanium panels was between the metal skin and the primer coating. Electron microscopy showed that the surface of the titanium skin was too smooth to favor physical bonding. Further examination showed there were no bonded areas suitable for analysis. The skins of the aluminum panels showed the bonded areas exhibited a microetchpit structure which was not present in the poorly bonded areas. It was concluded that the lack of bond of the aluminum panels was not the result of surface contamination but rather a function of the pickling parameters and perhaps the annealing of the aluminum. (Author)

AD-776 400/4GA PC$3.00/MF$1.45
Washington Univ Seattle Coll of Engineering
INFLUENCE OF STRESS, STRAIN AND STRAIN RATE ON DYNAMIC FRACTURE.
Final rept.,
Ian M. Fyfe, and Douglas H. Polonis. Jan 74, 13p
AROD-9504.5-E
Grants DA-ARO-D-31-124-70-G91, DA-ARO-D-31-124-72-G126

Descriptors: *Aluminum alloys, *Fracture(Mechanics), Dynamics, Stresses, Tensile properties, Aging(Materials), Crack propagation, Strain(Mechanics), Inclusions.
Identifiers: Microcracks, Aluminum alloy 2024, Aluminum alloy 6061.

The work presented in this report summarizes the results obtained from an examination of dynamic fracture in aluminum alloys under biaxial strain conditions. It is shown that the initiation of dynamic fracture is controlled by the maximum principal stress and the pulse duration. The geometry of the fracture surface is explained in terms of the nucleation of microcracks, and the extent of the fracture is strongly dependent on the aging treatment undergone by the alloy. (Author)

AD-776 425/1GA PC$4.75/MF$1.45
Lockheed-California Co Burbank
GALVANIC CORROSION EFFECTS ASSOCIATED WITH GRAPHITE COMPOSITE/METAL JOINTS,
G. R. Johnston, J. S. Fritzen, and K. E. Weber. Nov 73, 32p Rept no. LR-26088

Descriptors: *Galvanic corrosion, *Composite structures, Composite materials, Epoxy resins, Graphite, Aluminum alloys, Steel, Titanium alloys, Joints, Corrosion, Electrochemistry, Bonded joints, Moisture, Salt spray tests.
Identifiers: *Graphite reinforced composites, Aluminum alloy 2024, Aluminum alloy 7075, Titanium alloy 6Al 4V.

Contents:
The galvanic compatibility of graphite composites and structural metals;
Electrochemical investigations;
Mechanically fastened joints;
Adhesively bonded joints;
Moisture permeation in epoxy graphite composites.

AD-776 507/6GA Reprint
Michigan Technological Univ Houghton Dept of Metallurgical Engineering
RELATIVE GROWTH KINETICS OF LEDGED AND DISORDERED INTERPHASE BOUNDARIES,
C. Atkinson, K. R. Kinsman, and H. I. Aaronson. 17 Aug 73, 12p AROD-11264.1-MC
Grant DA-ARO-D-31-124-73-G144
Prepared in cooperation with the Imperial Coll. of Science and Technology, and London (England), Michigan Technological Univ., Houghton. Dept. of Metallurgical Engineering.
Availability: Pub. in Scripta Metallurgica, v7 p1105-1114 1973.

Descriptors: *Crystal structure, *Phase transformations, Numerical analysis, Aluminum alloys, Silver alloys.

The ledged interphase boundaries considered in this letter are taken to have broad faces whose structure is sufficiently coherent to render them immobile in the direction normal to these faces; all motion thus takes place by the formation and lateral movement of the ledges. Since the average distance between ledges is usually substantially greater than the ledge height these boundaries can be regarded as essentially planar. The disordered interphase boundaries discussed are considered to be planar and to migrate without interference from interfacial structure or adsoprtion effects.

AD-776 520/9GA Reprint
Florida Univ Gainesville Dept of Materials Science and Engineering
CONCERNING THE ANALYSIS OF TENSILE STRESS-STRAIN DATA USING LOG D SIGMA/D EPSILON P VERSUS LOG SIGMA DIAGRAMS,
Robert E. Reed-Hill, Walter R. Cribb, and Sergio N. Monteiro. 18 Jan 73, 6p AROD-9826.11-MC
Grant DA-ARO-D-31-124-72-G70
Availability: Pub. in Metallurgical Transactions, v4 p2665-2667 Nov 73.

Descriptors: *Stress strain relations, *Deformation, *Tensile properties, Metals.

Because the stages of a polycrystalline specimen are much less evident than those of a typical face centered cubic single crystal, some form of analysis is normally required to reveal them. The Hollomon and the Crussard and Jaoul methods of stress-strain analysis have been used for this purpose. While they also give parameters descriptive of the deformation in the various stages, they are inherently deficient. A modified Swift equation containing stress as the principle variable is used to develop these diagrams. Advantages and disadvantages of this newer method are compared to previous methods of empirical stress-strain analysis. (Modified author abstract)

AD-776 534/8GA Reprint
Lehigh Univ Bethlehem Pa Center for Surface and Coatings Research
NONDESTRUCTIVE MONITORING BY MOSSBAUER SPECTROSCOPY OF THE RATE OF CORROSION OF COATED METAL AT THE METAL-POLYMER INTERFACE,
Henry Leidheiser, Jr., G. W. Simmons, and Elsie Kellerman. 21 Jun 73, 5p AROD-11309.1-MC
Contract DA-ARO-D-31-124-73-G110
Revision of report dated 9 Apr 73.
Availability: Pub. in Jnl. of the Electrochemical Society, v120 n11 p1516-1518 Nov 73.

Descriptors: *Corrosion, Nuclear radiation spectroscopy, Cobalt, Organic coatings, Polybutadiene, Interfaces, Mossbauer effect.
Identifiers: *Mossbauer spectroscopy, Tracer studies.

Cobalt doped with Co-57 was electrodeposited on a cobalt substrate from a saturated ammonium oxalate solution. The Mossbauer emission spectrum was determined for (a) the as-deposited sample; (b) during cathodic treatment; (c) after coating with a proprietary polybutadiene; and (d) after exposure of the coated material to 3% NaCl solution. The conversion of elemental metal to ionic species at the metal/polymer interface was followed as a function of time. (Author)

AD-776 548/7GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
AUGER ELECTRON SPECTROSCOPY ANALYSIS OF THE FRACTURE SURFACES OF IRRADIATED PRESSURE-VESSEL STEELS.
Interim rept.,
F. A. Smidt, Jr., D. F. Stein, and A. Joshi. 21 Dec 73, 12p Rept no. NRL-7660

Descriptors: *Steel, Fracture(Mechanics), Surfaces, Spectroscopy, Auger electrons, Pressure vessels, Reactor materials, Weldments, Embrittlement, Radiation effects.
Identifiers: *Auger electron spectroscopy, Steel A-302B, Steel A-533B.

Pressure-vessel steels and weldments containing the residual elements copper and phosphorus show a marked tendency toward embrittlement after irradiation at 290C. Auger electron spectroscopy was used to analyze fracture surfaces of these materials to ascertain if segregation of copper and phosphorus during irradiation was responsible for the embrittlement. No evidence of segregation was found. An alternative mechanism is suggested in which the residual elements modify the defect microstructure, with attendant increases in yield strength and ductile-to-brittle transition temperature. (Author)

AD-776 571/2GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va

THE EFFECTS OF TEMPERATURE ON MECHANICAL PROPERTIES OF CERTAIN MOLYBDENUM AND TUNGSTEN ALLOYS,
B. A. Klypin, and N. N. Morgunova. 20 Dec 73, 8p
Rept no. FSTC-HT-23-2555-72
Trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Chernoi Metallurgii. Sbornik Trudov (USSR) n77 p67-71 1970.

Descriptors: *Molybdenum alloys, *Tungsten alloys, Temperature, Recrystallization, Mechanical properties, Translations, USSR.

AD-776 599/3GA Reprint
Illinois Univ Urbana Materials Research Lab
TRANSFORMATIONS IN RARE EARTH METALS,
Carl J. Altstetter. 1973, 10p AROD-8101.2-MC
Grant DA-ARO-D-31-124-73-G43
Availability: Pub. in Metallurgical Transactions, v4 p2723-2730 Dec 73.

Descriptors: *Rare earth elements, *Phase transformations, *Crystal structure, Atomic structure, Energy levels.
Identifiers: Lattice parameters, *Rare earth alloys.

The crystal structures of rare earth metals and intrarare earth alloys are described and studies of the phase transformations in these metals are surveyed. Comparison is made with similar transformations in other alloy systems. Knowledge of the thermodynamics, kinetics and mechanisms of transformations in the rare earths is assessed and directions for future work are suggested. (Author)

AD-776 603/3GA Reprint
Franklin Inst Swarthmore Pa Bartol Research Foundation
CESIUM ENHANCED OXIDATION OF Ni(100),
C. A. Papageorgopoulos, and J. M. Chen. 16 Jul 73, 5p AROD-8906.9-P
Grant DA-ARO-D-31-124-73-G124
Availability: Pub. in Solid State Communications, v13 n9 p1455-1457 1973.

Descriptors: *Nickel, *Oxidation, *Cesium, Surfaces, Crystal structure, Nickel compounds, Work functions.
Identifiers: Nickel oxides.

It has been found by LEED and work function measurements that the presence of a fractional monolayer of Cs increased the oxidation rate of a Ni(100) surface by about thirteenfold. The NiO formed in two crystallographic orientations depending on the initial Cs coverage. Work function measurements suggest that in the enhanced oxidation the Cs atoms remained on top of the oxide. (Author)

AD-776 621/5GA PC$3.00/MF$1.45
Illinois Univ Urbana Dept of Metallurgy and Mining Engineering
STRESS-VELOCITY RELATIONS FOR DISLOCATIONS IN NIOBIUM.
Technical rept.,
R. P. Walson, and H. K. Birnbaum. Feb 74, 20p
Contract N00014-67-A-0305-0020

Descriptors: *Niobium, *Dislocations, Stresses, Crystal structure, Temperature.
Identifiers: Body centered cubic lattices.

The stress-velocity relations for screw and mixed dislocations in high purity niobium were studied at 298K and 196K. Etch pitting methods were used to reveal the dislocation positions after stress pulses in tension and compression. Attention was particularly directed towards establishing any asymmetry in the motion of dislocations on the (112). No asymmetry was observed for either screw or mixed dislocations moving on the (112). The motion at 298K at low stresses was limited by extrinsic barriers while that at 196K and high stresses seemed limited by intrinsic dislocation drag. (Author)

AD-776 667/0GA PC$7.00/MF$1.45
Texas Engineering Experiment Station College Station
A COMPARISON OF CURRENT WORK-HARDENING MODELS USED IN THE ANALYSIS OF PLASTIC DEFORMATIONS,
Barry Hunsaker, Jr., David K. Vaughan, James A. Stricklin, and Walter E. Haisler. Oct 73, 79p Rept no. TEES-RPT-2926-73-3
Contract N00014-68-A-0308-0004

Descriptors: *Plastic deformation, Plastic properties, Models, Increments, Hardening, Structural properties, Steel, Aluminum alloys, Rings, Bodies of revolution, Shells(Structural forms), Metal plates.
Identifiers: Finite element analysis, Steel 4340, Steel 1020, Aluminum alloy 2024, Aluminum 6061, Structural analysis.

The report presents an evaluation of four hardening rules of the incremental theory of plasticity to determine which of the rules are better suited for use in finite element or finite difference structural analysis computer programs. The hardening rules considered are isotropic hardening, the Prager-Ziegler kinematic hardening rule, the Mroz model, and the mechanical sublayer model. Comparisons of experimental data with hardening rule predictions (from a total incremental plasticity formulation using the von Mises yield condition and associated flow rule) for simple loading paths are first considered. Next the computer storage requirements associated with each hardening rule are investigated. Finally, the two most promising hardening rules are incorporated into an existing dynamic, shell of revolution finite element computer code and the cases of an impulsively loaded circular ring and circular plate are examined. Conclusions regarding the areas of applicability of each hardening rule are then presented. (Author)

AD-776 677/7GA Reprint
Ohio State Univ Columbus Dept of Metallurgical Engineering
PHASE TRANSFORMATIONS IN METALS AND ALLOYS,
Glyn Meyrick, and Gordon W. Powell. 1973, 37p AROD-8665.1-MC
Grant DA-ARO-D-31-124-72-G133
Availability: Pub. in the Annual Review of Materials Science, v3 p327-362 1973.

Descriptors: *Phase transformations, *Reviews, Metals, Alloys.

The objective of this review is primarily to summarize on the basis of experimental observations the current knowledge of the morphological and growth characteristics of the various modes of transformation. It does not consider in any great detail mathematical models of these reactions. Each of the various modes of transformation will be considered under one of three broad groups of solid state reactions: (1) diffusional transformations, (2) displacive transformations, and (3) hybrid (mixed mode) transformations. (Author)

AD-776 746/0GA PC$6.50/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ELECTRON-BEAM MELTING AND REFINING OF METALS AND ALLOYS,
B. E. Paton. 7 Mar 74, 271p Rept no. FTD-MT-24-26-74
Edited machine trans. of mono. Elektronnoluchevaya Plavka i Rafinirovanie Metallov i Splavov, n.p., 1973 p1-239, by Charles T. Ostertag, Jr.

Descriptors: *Electron beam melting, *Refining(Metallurgy), Physical chemistry, Thermophysical properties, Refractory metals, Iron, Steel, Metals, Alloys, Translations, USSR.

The thermophysical and physicochemical processes of electron-beam melting, and the structure and the properties of metallic materials after refining are examined. The structure and properties of pure rare and refractory metals are described. The features of the technology of electron-beam melting and equipment are examined.

AD-776 763/5GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
THE SURFACE ABSORPTION OF UNPAINTED ALLOYS AT 10.6 MICRONS.
Final rept. Aug 71-Aug 73,
Stephan S. Cunningham, and William T. Laughlin. Mar 74, 34p Rept no. AFWL-TR-74-12

Descriptors: *Carbon dioxide lasers, *Aluminum alloys, *Magnesium alloys, *Stainless steel, *Titanium alloys, Heat transfer, Absorption(Physical), Surface properties, Reflectivity.
Identifiers: *Laser heating, Aluminum alloy 2024, Magnesium alloy AZ31B, Titanium alloy 6Al 4V, Steel 304.

The surface absorption of 10.6-micrometer radiation was measured for alloys of aluminum, magnesium, stainless steel, and titanium. Coupling coefficient data were taken from one- and two-dimensional heat flow experiments where there were a wide range of heating rates and temperatures achieved. The relative importance of some experimental variables in laser effects experiments such as beam intensity profile, aiming error, sample-to-sample surface variations, etc., have been determined. For the samples of titanium and stainless steel brought through their melting points no changes in coupling due to temperature or oxide formation were resolved. A dependence of coupling coefficient on beam intensity was observed for the stainless steel alloy. (Author)

AD-776 824/5GA PC$3.25/MF$1.45
Battelle Columbus Labs Ohio
THE GROWTH OF CRYSTALS OF RARE EARTH-COBALT 1:5 COMPOUNDS.
Final technical rept. 1 Apr 70-31 May 72,
Alfred E. Austin, and James F. Miller. Jul 72, 66p
AFML-TR-72-132
Contract F33615-70-C-1477

Descriptors: *Rare earth compounds, *Cobalt alloys, *Crystal growth, Single crystals, Crystal defects, Magnetic domains, Intermetallic compounds, Samarium, Neodymium, Praseodymium, Permanent magnets, Vapor deposition.
Identifiers: Bridgman effect, Cobalt intermetallics, Samarium intermetallics, Neodymium intermetallics, Praseodymium intermetallics, Samarium alloys, Neodymium alloys, Praseodymium alloys.

Techniques were developed for the growth of single crystals of SmCo5, NdCo5, Sm(1-x)Nd(x)Co5 and PrCo5. The preferred method was by slow Bridgman drop of rare-earth rich melts in pyrolytic boron nitride containers. Large crystals, up to 2 x 1.5 x 1.5 cm of SmCo5 were grown with low oxygen content of 50 to 75 ppm. X-ray topography and rocking crystal curves were used for characterization of single crystals of SmCo5. The main crystal imperfections were low angle (0.5 to 1.5 degrees) boundaries and dislocations. It was shown that the low-angle boundaries pin magnetic domain walls with about 500 oersted magnetic fields needed for moving the domain walls. The vapor phase reduction of samarium tricyclopentadienyl and cobalt biscyclopentadienyl was demonstrated to yield Sm, Co, and Sm2Co17 at 500C. (Author)

AD-776 970/6GA PC$3.75/MF$1.45
Ohio State Univ Research Foundation Columbus
PHASE TRANSFORMATIONS IN VAPOR-QUENCHED MOLYBDENUM AND MOLYBDENUM GOLD ALLOYS.
Final rept. 15 Mar 72-31 Oct 73,
G. Pilkington, G. Antwi-Boateng, and G. Meyrick. Feb 74, 73p AROD-8665.2-MC
Grants DA-ARO-D-31-124-70-G72, DA-ARO-D-31-124-72-G133

Descriptors: *Molybdenum alloys, *Gold alloys, *Molybdenum, *Phase transformations, Microscopy, Field emission, Electron microscopy, Crystal structure, Metal films.
Identifiers: Field ion microscopy.

Thin films of Mo and of metastable single-phased Mo-Au alloys were prepared by vapor-quenching and subjected to a variety of aging treatments while their microstructural characteristics were studied by high resolution microscopy and through electric resistance measurements. When aged above 400C the alloys transformed by a complex process which involved competition among internal precipitation, surface precipitation and evaporation of the gold. The transformation was associated with resistance changes that followed second order kinetics, and activation energies that tended to increase as the transformation progressed. Depending upon the quality of the vacuum and the temperature of deposition amorphous, fcc and bcc modifications of molybdenum were produced. (Author)

AD-776 976/3GA PC$4.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
SURVEY OF ACTIVITIES IN THE FIELD OF LOW-CYCLE HIGH TEMPERATURE FATIGUE.
Critical rept.,
J. M. Drapier. Feb 74, 149p* Rept no. AGARD-618
Presented at the Meeting of the AGARD Structures and Materials Panel (37th), 7-12 Oct 73 in The Hague, Netherlands. NATO furnished.

Descriptors: *Fatigue(Mechanics), *High temperature research, Thermal cycling tests, Materials, Test equipment, Aircraft engines, Crack propagation, Strain(Mechanics), Stresses, Meetings, Data processing, Life(Durability), NATO, Reviews.
Identifiers: Design, *Fatigue tests.

Information on the activities in low-cycle high temperature fatigue testing of 35 laboratories in 7 NATO countries is presented in this report. Covered are various facets of the problem including materials, testing equipment and conditions, types of data and data plots, latest developments in prediction laws for fatigue behaviour, and design procedures for predicting lives in different engine components. This up-to-date survey concludes with a discussion of the aspects that should be investigated in future studies. (Author)

AD-776 986/2GA PC$4.75/MF$1.45
Battelle Columbus Labs Ohio
FAST FRACTURE RESISTANCE AND CRACK ARREST IN STRUCTURAL STEELS.
Progress rept.,
G. T. Hahn, R. G. Hoagland, M. F. Kanninen, A. R. Rosenfield, and R. Sejnoha. Jun 73, 129p* SSC-242
Contract N00024-72-C-5142

Descriptors: *Fracture(Mechanics), *Steel, Crack propagation, Dynamics, Mathematical models, Wedges, Loads(Forces), Ship plates.
Identifiers: Finite element analysis, Fracture tests.

Measurements and calculations of unstable fracture and fracture arrest in 12.7 mm- and 25.4 mm-thick, high-strength SAE4340 steel and A517F steel plates are described. A fully dynamic analysis of unstable crack propagation and arrest in the DCB (double cantilever beam)-test piece is derived. The technique is based on the beam-on-elastic-foundation model of the DCB specimen used previously but with the simple beam and foundation representations replaced by a Timoshenko beam and a generalized elastic foundation. Crack speeds, energy levels, and the crack length at arrest are calculated with this model using finite-difference method and are compared with the measurements. The kinetic energy imparted to the test piece is recovered and contributes to the crack driving force. It follows from this that fracture arrest is controlled by the history of energy dissipation throughout the entire propagation event, rather than on Ka, a single static toughness value calculated at the arrest point. (Modified author abstract)

AD-777 009/2GA PC$3.25/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
COMPARISON OF VARIOUS METHODS OF MEASURING K1C ON SMALL PRECRACKED BEND SPECIMENS THAT FRACTURE AFTER GENERAL YIELD.
Technical rept.,
J. N. Robinson, and A. S. Tetelman. Jan 74, 44p
Rept nos. UCLA-ENG-7409, TR-13 AROD-8016.12-MC
Contract DAHC04-69-C-0008

Descriptors: *Steel, *Fracture(Mechanics), *High strength alloys, Measurement, Bending, Yield point, Cracks, Aluminum alloys.
Identifiers: Fracture toughness, *Stress intensity factor, Aluminum alloy 2024.

An experimental investigation into the measurement of fracture toughness on small precracked bend specimens after general yield is described. Six parameters are compared on the basis of their accuracy and utility in predicting KIc. The parameters are: (1) the on-load crack tip opening displacement, COD, (2) the lateral (notch root, crack tip) contraction, NRC, (3) the angle of bend, (4) the stretch zone, (5) the J integral, and (6) the equivalent energy. The results show that, from the standpoint of accuracy and of ease of measurement, the plane strain COD at fracture initiation, (COD)Ic, is the most useful parameter for measuring KIc on small specimens that fracture after general yield. (Author)

AD-777 031/6GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
THE EFFECTS OF CHROMATE CONVERSION COATING ALUMINUM STRESS CORROSION SPECIMENS.
Progress rept.,
I. S. Shaffer. 18 Mar 74, 16p Rept no. NADC-74041-30

Descriptors: *Stress corrosion, *Aluminum alloys, *Chromates, Coatings, Sodium chloride, Test methods, Detection.
Identifiers: Aluminum alloy 7075.

A major problem in assessing stress corrosion susceptibility of 7XXX series aluminum alloys by alternate immersion in a 3.5% NaCl aqueous solution is excessive pitting corrosion. An investigation was initiated to determine if chromate conversion surface treatment would improve the sensitivity of the alternate immersion test by minimizing pitting and gross corrosion. Results of alternate immersion tests of coated and bare 7075 tensile bar and C-ring specimens showed that stress corrosion cracks were easier to detect on chromate conversion coated specimens. (Author)

AERE-R-7607 PC$3.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
COMPATIBILITY OF TYPE 316 STAINLESS STEEL AND NITROGEN IN THE PRESENCE OF SODIUM.
A. Yates, and R. Paris. Nov 73, 14p
U.S. Sales Only.

Descriptors: (*Stainless steel-316, *Corrosion), (*Sodium, *Corrosive effects), (*Nitrogen, Corrosive effects), Compatibility, High temperature.

For abstract, see NSA 29 07, number 16193.

BMI-X-639 PC$5.50/MF$1.45
Battelle Columbus Labs., Ohio (Usa).
CHARACTERISTICS OF COMMERCIAL VACUUM-HOT-PRESSED BERYLLIUM. PART II. SUMMARY REPORT.
S. H. Gelles. Dec 72, 67p UCRL-13589

Descriptors: (*Beryllium, *Embrittlement), Dislocations, Electron microscopy, Grain orientation, Grain size, High temperature, Hot pressing, Impurities, Low pressure, Mechanical properties, Strains, Tensile properties, Time dependence, Yield strength.

For abstract, see NSA 29 07, number 16239.

CEA-CONF-2358 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
METHOD FOR STUDYING THE TEXTURE OF REACTOR MATERIALS.
J. Lefranc. 1973, 9p CONF-730571-2
In French. U.S. Sales Only.

Descriptors: (*Zirconium alloys, *Texture), (*Reactor materials, Texture), (*Uranium, Texture), (*Pressure tubes, Texture), Mechanical structures, Nondestructive testing.

For abstract, see NSA 29 07, number 16240.

CEA-R-4528 PC$11.75/MF$1.45
Cea Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
EFFECT OF HYDROGEN ON THE BEHAVIOR OF METALS. II. HYDROGEN EMBRITTLEMENT OF TITANIUM ALLOY TV13CA: EFFECT OF OXYGEN; COMPARISON WITH NONALLOYED TITANIUM.
J. P. Arditty. Nov 73, 194p
In French. U.S. Sales Only.

Descriptors: (*Titanium, *Embrittlement), (*Titanium base alloys, Embrittlement), (*Hydrogen, *Chemical reactions), (*Oxygen, Chemical reactions), Chemical composition, Deformation, Diffusion, Hardening, Hydrides, Oxides, Solubility.

For abstract, see NSA 29 07, number 17999.

COO-1367-56 PC$3.00/MF$1.45
Northwestern Univ., Evanston, Ill. (Usa). Dept. Of Materials Science.
EFFECT OF POINT DEFECTS ON MECHANICAL PROPERTIES OF METALS. TECHNICAL PROGRESS REPORT.
M. Meshii. 1973, 14p
Contract AT(11-1)-1367

Descriptors: (*Iron carbides, *Physical radiation effects), (*Iron, Physical radiation effects), Bcc lattices, Carbon, Electron beams, Hardness, Interstitials, Mechanical properties, Orientation, Point defects, Polycrystals, Shear, Stresses, Yield strength.

For abstract, see NSA 29 07, number 16344.

COO-2296-3 PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa). Dept. Of Mechanical and Aerospace Sciences.
NATURE OF SIMULTANEOUS PROCESSES IN PLASTIC DEFORMATION.
J. C. M. Li. 1972, 20p CONF-7210112-1

Descriptors: (*Metals, Deformation), (*Alloys, Deformation), (*Deformation, *Kinetics), Mechanical properties, Plasticity, Pressure dependence, Strains, Stresses, Temperature dependence, Time dependence.

For abstract, see NSA 29 07, number 18006.

COO-3827-16 PC$11.25/MF$1.45
Columbia Univ., New York (Usa). Liquid Metals Research Lab.

EXPERIMENTAL DETERMINATION OF THE CRITICAL POINT AND HIGH-TEMPERATURE SATURATED PHASE DENSITIES OF RUBIDIUM.
J. W. Chung, and C. F. Bonilla. 1972, 185p
Contract AT(30-1)-2660

Descriptors: (*Rubidium, *Critical temperature), Capsules, Compressibility, Computer calculations, Critical pressure, Density, Phase transformations, Very high temperature.

For abstract, see NSA 29 07, number 18007.

GKSS-73-E-22 PC$3.25/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Geesthacht-Tesperhude (F.R. Germany).
FULLY AUTOMATIC INSTALLATION FOR NOTCH IMPACT BENDING TESTS OF RADIOACTIVE SPECIMENS IN THE TEMPERATURE RANGE -160 EXP 0 C TO +200 EXP 0 C.
H. D. Hebenbrock, and H. H. Timm. 1973, 21p
In German. U.S. Sales Only.

Descriptors: (*Steels, *Impact tests), (*Cast iron, Impact tests), (*Remote handling equipment, *Design), (*Radioactive materials, Impact tests), Bending, High temperature, Hot cells, Irradiation, Low temperature, Medium temperature, Notches.

For abstract, see NSA 29 07, number 16423.

HEDL-SA-581 PC$4.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
HIGH STRAIN RATE TENSILE PROPERTIES OF IRRADIATED ASTM A533-B PRESSURE VESSEL STEEL. HEAVY SECTION STEEL TECHNOLOGY PROGRAM TECHNICAL REPORT NO. 32.
J. M. Steichen, and J. A. Williams. Jul 73, 38p
CONF-731044-1
Contract AT(45-1)-2170

Descriptors: (*Steel-astm-a533, *Physical radiation effects), Correlations, Deformation, Ductility, Fast neutrons, Fractures, Neutron beams, Temperature dependence, Tensile properties, Yield strength.

For abstract, see NSA 29 07, number 16345.

JUL-991-TP PC$7.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Technische Physik.
VOLUME DIFFUSION IN THE MOLYBDENUM--TUNGSTEN SYSTEM.
W. Erley. Aug 73, 97p
In German. U.S. Sales Only.

Descriptors: (*Tungsten alloys, *Diffusion), (*Molybdenum alloys, Diffusion), Monocrystals, Temperature dependence, Very high temperature.

For abstract, see NSA 29 07, number 16250.

N74-17192/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEXTURING AND RESIDUAL STRESS IN METALS AS A RESULT OF SLIDING.
D. R. Wheeler. Feb 74, 17p NASA-TN-D-7578, E-7734

Descriptors: *Metal working, *Residual stress, *Sliding friction, Copper alloys, Iron, Photographic measurement, Textures, X ray diffraction.

For abstract, see STAR 1208

N74-17196/8GA PC$8.75/MF$1.45
Sherritt Gordon Mines, Ltd., Fort Saskatchewan (Alberta).
PROCESS DEVELOPMENT FOR NI-CR-THO2 AND NI-CR-AL-THO2 SHEET.
R. C. Cook, and L. F. Norris. Dec 73, 115p NASA-CR-134484
Contract NAS3-14313

Descriptors: *Chromium alloys, *Metal plates, *Nickel alloys, *Production engineering, *Thorium oxides, Mechanical properties, Oxidation resistance.

For abstract, see STAR 1208

N74-17197/6GA PC$4.50/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
ELECTROSLAG CASTING OF FORGED INGOTS.
L. A. Kamenskii, V. A. Kudrin, A. B. Mostovoi, V. V. Golovchenko, and L. F. Vygodner. 1974, 28p NRC-TT-1721
Tran-Transl. Into English from SB. Trudov Mosk. Vechernego Met. Inst. (Moscow), V. 10, 1971 p 146-162.

Descriptors: *Electroslag process, *Electroslag refining, *Ingots, *Steels, Chemical properties, Metallography, Microstructure, Physical properties.

For abstract, see STAR 1208

N74-17238/8GA PC$7.00/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio.
HYDROGEN GAS EMBRITTLEMENT AND THE DISC PRESSURE TEST.
Final Report, Sep. 1971 - Nov. 1973.
E. J. Bachelet, and A. R. Troiano. 30 Nov 73, 76p
NASA-CR-134551
Contract NGR-36-027-040

Descriptors: *Embrittlement, *Heat resistant alloys, *Hydrogen, *Inconel (Trademark), Fatigue (Materials), Materials tests, Mechanical properties, Physical properties.

For abstract, see STAR 1208

N74-17251/1GA PC$4.50/MF$1.45
Defence Research Information Centre, Orpington (England).
THE EFFECT ON BEHAVIOUR IN USE OF THE COMPOSITION AND STRUCTURE OF ALUMINIUM BRONZES.
P. Weill-couly, and D. Arnaud. Nov 73, 26p DRIC-TRANS-3416, BR20705
Tran-Transl. Into English from Fonderies (Paris), No. 322, 1973 p 123-135.

Descriptors: *Aluminum alloys, *Bronzes, *Corrosion resistance, *Mechanical properties, Annealing, Binary alloys, Corrosion tests, Nickel, Sea water, Solid phases, Weldability.

For abstract, see STAR 1208

N74-17252/9GA PC$4.50/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands). Div. Structures and Materials.
HEAT TREATMENT AND SCC SUSCEPTIBILITY OF AU 4 SG TYPE FORGED MATERIAL.
H. P. Vanleeuwen, and L. Schra. Jan 73, 27p NLR-TR-73014-U
Subm-Sponsored by the Neth. Agency for Aerospace Programs.

Descriptors: *Aluminum alloys, *Forging, *Heat treatment, *Stress corrosion cracking, Aging (Metallurgy), Copper, Hardness, Magnesium.

For abstract, see STAR 1208

N74-17253/7GA PC$4.00/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands). Div. Structures and Materials.
FRETTING AND FATIGUE UNDER COMPLEX FATIGUE FOADS.
H. P. Vanleeuwen, A. Nederveen, and H. H. Ruiter. Feb 73, 18p NLR-TR-73015-U
Subm-Sponsored by the Directorate of Materiel Air, Roy. Neth. Air Force.

Descriptors: *Aluminum alloys, *Fretting, *Lugs, *Metal fatigue, Clamps, Fatigue tests, Lubrication, Metal joints, Pins, Vibratory loads.

For abstract, see STAR 1208

N74-17254/5GA PC$4.50/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands). Div. Structures and Materials.
STRESS INTENSITY FACTOR SOLUTIONS FOR A CORNER FLAW AT A HOLE AND THEIR APPLICATION TO DESIGN.
R. J. H. Wanhill. Jan 73, 30p NLR-TR-73016-U

Descriptors: *Crack propagation, *Stress concentration, *Titanium alloys, Fatigue life, High strength alloys, Holes, Structural design.

For abstract, see STAR 1208

N74-17255/2GA PC$4.50/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands). Div. Structures and Materials.
FATIGUE CRACK PROPAGATION DATA FOR TITANIUM SHEET ALLOYS, IMI 130.
Interim Report.
R. J. H. Wanhill, A. E. Meulman, and W. J. Vandervet. Feb 73, 30p NLR-TR-73024-U, IR-4
Subm-Sponsored by Neth. Agency for Aerospace Programs.

Descriptors: *Crack propagation, *Fatigue tests, *Metal sheets, *Titanium alloys, Air, Argon, Environmental tests, Metal fatigue, Sodium chlorides, Water.

For abstract, see STAR 1208

N74-17256/0GA PC$6.50/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands). Div. Structures and Materials.
STUDY OF THE GROWTH OF STRESS CORROSION CRACKS IN THE ALUMINIUM ALLOY 7075. PART 2: INVESTIGATION ON THE EFFECT AND THE ROLE OF THE CORROSION POTENTIAL.
A. Hartman. Nov 72, 70p NLR-TR-72136-U
Subm-Sponsored by the Neth. Agency for Aerospace Programs.

Descriptors: *Aluminum alloys, *Crack propagation, *Electric potential, *Stress corrosion cracking, Bending, Circuits, Electric current, Pitting, Sodium chlorides.

For abstract, see STAR 1208

N74-17285/9GA PC$5.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
THE DETECTION OF FATIGUE CRACKS BY NONDESTRUCTIVE TESTING METHODS.
Contractor Report, Nov. 1971 - Jun. 1973.
W. D. Rummel, P. H. Todd, Jr., S. A. Frecska, and R. A. Rathke. Feb 74, 158p NASA-CR-2369, MCR-73-145
Contract NAS9-12276

Descriptors: *Cracking (Fracturing), *Metal fatigue, *Nondestructive tests, *X ray inspection, Acoustic properties, Aluminum alloys, Holography, Radiography, Ultrasonics.

For abstract, see STAR 1208

N74-17623/1GA PC$4.50/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).

FATIGUE CRACK GROWTH IN ALUMINUM ALLOY SHEET MATERIAL UNDER FLIGHT-SIMULATION LOADING. EFFECTS OF DESIGN STRESS LEVEL AND LOADING FREQUENCY.
J. Schijve, F. A. Jacobs, and P. J. Tromp. 1973, 26p NLR-TR-72018-U
Subm-Submitted for Publication Sponsored by Neth. Agency for Aerospace Programs.

Descriptors: *Aluminum alloys, *Crack propagation, *Cyclic loads, *Flight simulation, *Metal sheets, Fatigue tests, Metal fatigue, Stress concentration, Stress cycles.

For abstract, see STAR 1208

PAT-APPL-440 432 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
CHEMICAL MINING OF COPPER PORPHYRY ORES.
Patent Application,
Harold J. Heinen, Thomas G. Carnahan, and Judith A. Eisele. Filed 7 Feb 74, 13p
DOCKET/MIN-2105
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Copper ores, *Solution mining, *Patent applications, Iron, Sulfuric acid, Chlorides, Oxygen, Porphyry.
Identifiers: PAT-CL-299-5.

In the patent application copper porphyry ores, especially those too deeply buried for conventional open pit mining, are mined in place by an in situ leaching technique using as a leaching medium a mixture of dilute sulfuric acid, oxygen and an alkali metal or ammonium chloride salt. The chloride ion speeds dissolution of copper minerals, especially chalcopyrite, and the alkali metal or ammonium ion reacts with iron and sulfate in the leaching medium to deposit iron in the form of crystalline jarosites.

PAT-APPL-447 716 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
CHEMICAL MINING OF COPPER PORPHYRY ORES.
Patent Application,
Thomas G. Carnahan, and Harold J. Heinen. Filed 4 Mar 74, 14p DOCKET/MIN-2162
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Copper ores, *Solution mining, *Patent applications, Iron, Sulfuric acid, Nitrates, Oxygen, Porphyry.
Identifiers: PAT-CL-299-5.

In the patent application copper porphyry ores, especially those too deeply buried for conventional open pit mining, are mined in place by an in situ leaching technique using as a leaching medium a mixture of dilute sulfuric acid, oxygen and nitrate ion added either as nitric acid or as an alkali metal or ammonium nitrate salt. The nitrate ion speeds dissolution of copper minerals, especially chalcopyrite, and the alkali metal or ammonium ion reacts with iron and sulfate in the leaching medium to deposit iron in the form of crystalline jarosites.

PATENT-3 890 111 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF MANUFACTURING TITANIUM AND TITANIUM ALLOYS.
Patent,
Stephen M. Shelton. Filed 30 Mar 56, patented 9 Jun 59, 3p PAT-APPL-575 287, DOCKET/MIN-276
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Titanium, *Titanium alloys, *Patents, Manufacturing, Metallurgy, Chemical reactors.
Identifiers: PAT-CL-75-84-4.

The patent consists in providing means for accomplishing a rapid reaction while maintaining the contact zone between the reactor walls and the reacting mass relatively cool. This is accomplished by initiating the reaction centrally of the mass and propagating the reaction outwardly toward the walls of the reactor and, at the same time, cooling the reactor walls.

PATENT-3 005 690 Not available NTIS
Department of the Interior, Washington, D.C.
MULTIPLE COMPARTMENT ROTARY DRUM FOR THE LEACHING OF ORES OR RELATED PRODUCTS IN A CONTINUOUS COUNTER-CURRENT SYSTEM.
Patent,
Charles Prasky, and Willard S. Swanson. Filed 15 Jan 60, patented 24 Oct 61, 4p PAT-APPL-2 791, DOCKET/MIN-345
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Leaching, *Patents, Extractive metallurgy, Cylindrical bodies, Separators.
Identifiers: PAT-CL-23-269.

The patent provides an improved rotary-type apparatus for continuously bringing into intimate contact solid particulate material with liquid or liquids. More particularly, it is an object of this invention to provide an apparatus for continuously extracting a soluble component from a particulate solid mixture in which the liquid solvent and the solid move counter-currently through the apparatus. It provides a rotary leaching apparatus which is divided into a plurality of chambers, each of these chambers communicating with its neighbor by an off-center opening.

PATENT-3 184 302 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS, REMOVAL OF OXYGEN AND ALUMINUM FROM METALS PREPARED BY ALUMINOTHERMIC AND SIMILAR PROCESSES.
Patent,
Carl J. Chindgren. Filed 24 Jan 63, patented 18 May 65, 3p PAT-APPL-253 773, DOCKET/MIN-499
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Refractory metals, *Vanadium, *Patents, Purification, Aluminum, Oxygen, Barium oxides.
Identifiers: PAT-CL-75-84, Barium peroxide.

It is an object of the present invention to provide a process for removal of oxygen and/or aluminum from reduced refractory metals or powders to yield metals of improved quality for direct fabrication or master alloy usage. The process of the invention has been found to be particularly effective in preparation of high-purity ductile vanadium and is described in detail with reference to this metal; however, it is applicable to other refractory metals such as zirconium, tantalum, tungsten, titanium, chromium and molybdenum.

PATENT-3 244 475 Not available NTIS
Department of the Interior, Washington, D.C.
SOLVENT EXTRACTION PROCESS FOR SEPARATING RHENIUM FROM MOLYBDENUM.
Patent,
Philip E. Churchward. Filed 31 Oct 62, patented 5 Apr 66, 2p PAT-APPL-234 567, DOCKET/MIN-535
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rhenium, *Extraction, *Molybdenum, *Patents, Quarternary ammonium salts.
Identifiers: PAT-CL-23-22, Ammonium chloride/methyl-tridecanoyl.

The patent discloses that rhenium may be concentrated and recovered from aqueous solutions by means of a solvent extraction process in which a particular quaternary ammonium compound is used as the essential component of the extractant. Such a process may be carried out using simple and inexpensive equipment and may be operated in a continuous manner. The quaternary ammonium compound which has been found to make the solvent extraction process feasible is tricapryl methyl ammonium chloride.

PATENT-3 260 658 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR THE RECOVERY OF RHENIUM.
Patent,
Philip E. Churchward. Filed 31 Oct 62, patented 12 Jul 66, 2p PAT-APPL-234 566, DOCKET/MIN-548
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electrowinning, *Rhenium, *Patents, Perchloric acid, Sulfates, Sodium sulfates, Annonium sulfate, Magnesium sulfates.
Identifiers: PAT-CL-204-109.

The patent describes a method for electrowinning rhenium from a rhenium-containing perchloric acid solution. It involves adding to said solution an inorganic sulfate from the group consisting of ammonium sulfate and an alkali metal sulfate and electrolyzing the resulting solution to deposit metallic rhenium on the cathode employed in the electrolysis.

PATENT-3 273 995 Not available NTIS
Department of the Interior, Washington, D.C.
RECOVERY OF ZINC FROM ZINC DIE-CAST SCRAP.
Patent,
John A. Ruppert, and Paul M. Sullivan. Filed 22 May 64, patented 20 Sep 66, 4p PAT-APPL-369 644, DOCKET/MIN-705
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Zinc, *Materials recovery, *Metal scrap, *Patents, Iron chlorides, Reclamation, Aluminum, Aluminum alloys, Zinc alloys, Intermetallic compounds, Iron compounds, Aluminum compounds.
Identifiers: PAT-CL-75-63.

The patent provides an efficient and economical process for removal of aluminum from zinc-aluminum alloys. Also provided is a process for reclaiming zinc from die-cast scrap. The objectives may be accomplished by treatment of the molten zinc-aluminum alloy with an iron halide which serves as a flux, converting part of the aluminum to aluminum halide and most of the remaining aluminum to a solid, separable, iron-aluminum intermetallic compound.

PATENT-3 282 678 Not available NTIS
Department of the Interior, Washington, D.C.
SMELTING REDUCED IRON ORE PELLETS IN THE BLAST FURNACE.
Patent,
Norwood B. Melcher, Morris M. Fine, and Philip L. Woolf. Filed 16 Jan 64, patented 1 Nov 66, 4p PAT-APPL-338 268,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Smelting, *Pig iron, *Patents, Blast furnaces, Iron ores, Pellets, Coke, Productivity.
Identifiers: PAT-CL-75-41.

The patent relates to a method of increasing blast furnace productivity and to lowering the coke rates of blast furnaces.

PB-227 581/6GA PC$4.50/MF$1.45
Michigan Univ., Ann Arbor. Dept. of Mechanical Engineering.
INTERRUPTED JET WATER GUN IMPACT-EROSION STUDIES ON METALLIC ALLOYS.
Technical rept.,
F. G. Hammitt, J. B. Hwang, and Linh N. Do. Oct 73, 29p 01357-32-T
Grant NSF-GK-1889

Descriptors: *Water erosion, *Alloys, Hydraulic jets, Impact tests, Erosion, Aluminum alloys, Nickel alloys.

Erosion test results are reported for water impact tests using an interrupted water jet for perpendicular and angled impact over the velocity range 400 to 600 m/s, using primarily aluminum 1100-0 and F, and nickel 270 as test materials. These materials were previously used in related tests for a 'Round Robin' test program conducted by Committee G-2 of ASTM. Photographs indicating the development of the damage patterns as a function of impact angle are included. It is found for this particular device that maximum damage rate and minimum incubation period are obtained for an intermediate velocity (about 450 m/s). The existence of this maximum in the damage vs. velocity curve is a result of the change in shape of the jet leading edge as velocity is varied. It is also found, as expected, that damage at fixed velocity decreases strongly as the impingement angle is reduced from perpendicular impact.

PB-228 627/6GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
INFLUENCE OF MANGANESE ADDITIONS UPON PROPERTIES OF IRON ORE PELLETS.
Rept. of Investigations,
R. B. Schluter, and B. W. Carriere. Jan 74, 23p
BuMines-I-7870
Prepared by Twin Cities Metallurgy Research Center, Bureau of Mines, Minn.

Descriptors: *Iron ores, *Pelleting, *Manganese, Physical properties, Metallurgy.

Because most iron ore produced in the United States is marketed as low-manganese pellets, this investigation was carried out to determine the effects of adding manganese in several forms to iron ore pellets during the balling process. The pellets, prepared with manganese contents of from 1 to 5%, were evaluated and compared to standard pellets, for compression strength, reducibility and microstructure.

PB-230 181/0GA PC$5.50/MF$1.45
Council for Scientific and Industrial Research, Pretoria (South Africa). Chemical Engineering Research Group.
OPTIMISATION OF SOLUBLE URANIUM RECOVERY IN ROTARY VACUUM FILTRATION OF ACID-LEACHED GOLD ORE SLURRY.
Special rept.,
B. Verbaan, and M. A. J. McEvoy. May 73, 46p
SIR-SR-CENG-010, ISBN-0-7988-0457-2

Descriptors: *Uranium, *Vacuum filtration, Metallurgy, Metalliferous minerals, Gold, Vacuum filters, Rotary filters, Slurries, Recovery, Flocculants, South Africa.

The performance of a pilot rotary vacuum filter was shown to correlate with that of full scale equipment. Recovery of 97% of the soluble uranium was obtained in a single filtration stage (pilot filter) using feed pulp diluted to density 1440 kg/cu m and uranium-free wash; a corresponding 24% reduction in solids throughput was observed. Other results indicate that 98% recovery can be obtained by further dilution and the duty improved through an increased addition of flocculant. Single stage filtration should be tested with a full scale filter under the conditions recommended. Optimization strategies are outlined to suit various operating requirements.

PB-230 187/7GA PC$4.50/MF$1.45
Council for Scientific and Industrial Research Pretoria (South Africa). Chemical Engineering Research Group.
EFFECTS OF FLOOD WASHING OF SOLUBLE URANIUM ON ROTARY VACUUM FILTERS.
Special rept.,
B. Verbaan. May 73, 30p CSIR-SR-CENG-009, ISBN-0-7988-0456-4

Descriptors: *Uranium, *Vacuum filtration, Metallurgy, Washing, Rotary filters, Vacuum filters, Gold, Metalliferous minerals, Slurries, Recovery, South Africa.

The effect of a supernatant layer of wash liquor in the pan on the soluble uranium recovery and the solids filter duty was investigated and the results are discussed.

PB-230 214/9GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
INCLUSION DISTRIBUTION IN INGOTS OF RARE EARTH INOCULATED STEELS.
Open rept.,
M. Randle, and I. G. Davies. Feb 74, 18p
CDL/MT/15/73

Descriptors: *Carbon steels, *Rare earth containing alloys, *Inclusions, Ingots, Solidification, Separation, Great Britain.

In this study, consideration has been given to inclusion segregation in 15 and 5 cwt, Rare Earth element doped mild steel ingots. The presence of bottom cone macro-segregates in these systems has been confirmed, and a mechanism has been advanced to account for their formation. It is suggested, furthermore, that is mechanism will operate for the case of all refractory inclusion species in steel, be they the products of deoxidation, sulphide modification or some other treatment. A significant finding is that the form and extent of the bottom cone is a sensitive function of the ingot size. On a microscopic scale, the clustering and aggregation of the Rare Earth element - rich inclusions is thought to result directly from the mode of solidification of large ingots. Methods which might avoid or alleviate inclusion clustering and bottom cone segregation are briefly discussed.

PB-230 215/6GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
THE ROLE OF SOME PRECIPITANTS IN THE CONTROLLED ROLLING OF LOW CARBON MICRO-ALLOYED STEELS.
Open rept.,
M. G. Frost, and P. Majumdar. Feb 74, 15p
CDL/MT/17/73

Descriptors: *Carbon steels, *Metal rolling, *Inpact strength, Nitrogen, Aluminum, Niobium, Precipitates, Austenite, Great Britain.

A series of low carbon steels with various micro-allowing additions has been processed using two reverse rolling schedules, a continuous schedule and an interrupted schedule. The results indicate that a continuous schedule is always to be preferred if good impact properties are to be obtained. However, instead of the expected strengthening which might have been expected from a nitrogen addition, a loss in strength resulted when 0.012 wt% nitrogen was added to a low carbon-niobium steel. This is thought to be due to the increased N:C ratio resulting in a decrease in the solubility of the carbonitride at any given austenitising temperature resulting in earlier coarser precipitation. However, the addition of aluminium to a 0.08 wt.% Nb. 0.012 wt.% N2 steel resulted in improved impact properties, but failed to restore strength levels to those found in the N2-free steels.

PB-230 217/2GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
AN APPROACH TO SHOP FLOOR QUALITY CONTROL. DEVELOPMENT OF AN INSPECTION ANALYSER.
Open rept.,
A. D. Ambrose. Feb 74, 20p TB/CC/71/12

Descriptors: *Steels, *Quality control, *Spectrochemical analysis, Chromium, Molybdenum, Manganese, Vanadium, Portable equipment, Spectrographs, Great Britain.

A novel approach to the problem of grade identification in the plant is described. A light weight hand held probe delivers an electrical discharge to the component under test and is connected to a direct reading spectrometer by a flexible light guide. Using a simple DC Arc cource, chromium, molybdenum, manganese and vanadium have been determined in a testing time of about 30 s with a coefficient of variation of approximately 10%. Speed of testing is often more important than exact analysis. In trials a clear separation of the three principal chromium grades (residual, 1% and 2%) was obtained in under 10 s, without any surface preparation. With the available glass light guides, there is a choice of spectral lines for most elements but carbon, sulphur and phosphorus are excluded.

PB-230 218/0GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
COMPARISON OF FRACTURE TOUGHNESS INFORMATION DERIVED FROM THE WIDE PLATE TEST AND THE DEEP NOTCH TEST.
Open rept.,
P. Terry. Feb 74, 16p GS/PROD/149/2/73/C

Descriptors: *Weldments, Toughness, Weld defects, Steel, Metal plates, Notch tests, Fracture tests, Defects, Inclusions, Plastic deformation, Cracking(Fracturing), Great Britain.

Wide plate and deep notch tests were carried out on BS1501:161:Grade 32 material 25mm thick. It is shown that both test configurations give similar results in terms of the temperature for 0.5% strain to fracture. Analysis of the two specimen types using COD, indicates differences in tolerable defect sizes predicted from the two tests, these differences are thought to be due to differences in residual stress levels between the wide plate and deep notch specimens, the residual stress level being higher in the wide plate specimens. The differences are only significant however below the 0.5% strain transition temperature since above this temperature residual stresses are relieved by yielding in the test plates. Some estimates of the sizes of defects which could cause failure in service as opposed to the calculated tolerable defect sizes which are considered to be safe, show the large margin of safety between tollerable and critical defect sizes.

PB-230 235/4GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
THE THERMAL ANALYSIS OF NITRIDE PHASES IN STEEL.
Open research rept.,
G. White, R. Fisher, and G. Bradshaw. Feb 74, 20p
CAPL/SM/G/68/73

Descriptors: *Steels, *Nitrides, *Differential thermal analysis, *Mass spectroscopy, Nitrogen, Oxidation, Great Britain.

The thermal decomposition characteristics of residues containing nitride phases have been stu-

died using a system based upon the principle of simultaneous differential thermal analysis and effluent gas analysis. The characteristic oxidation temperatures of various nitrides isolated from ternary alloys of the type Fe-M-N, where M is a nitride forming element, were determined. Tests also showed that the identification of certain nitride phases present in mixtures of nitrides was feasible. Preliminary studies on residues isolated from quaternary alloys of the type Fe-M-N-C revealed problems which were attributed to the presence of carbon in the residues and further work is required before the technique can be extended to the examination of commercial steels.

PB-230 259/4GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
INHOMOGENEOUS DEFORMATION DURING THE HOT ROLLING OF SHEET STEELS,
A. Jones, and B. Walker. Feb 74, 17p SM/606/A

Descriptors: *Steels, *Metal rolling, Metal sheets, Deformation, Austenite, Recrystallization, Great Britain.

Recent laboratory work has indicated that recrystallization of austenite following the hot rolling of thin steel strip, proceeds inhomogeneously through the strip thickness in such a way that a recrystallization front is set up which progresses from the strip surface to the strip center with increasing time. It has been suggested that this phenomenon is due to a variation in the pattern of deformation through the strip thickness. The present investigation was undertaken in order to obtain information concerning the deformation conditions in the through-thickness direction of steel strip (less than 12.5mm thick) hot rolled on a laboratory mill.

RFP-1704 PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
TENSILE PROPERTIES OF BARE-ROLLED INGOT-SHEET BERYLLIUM FROM ROOM TEMPERATURE TO 800 EXP 0 C.
D. V. Miley, and R. P. Brugger. 13 Dec 73, 22p
Contract AT(29-1)-1106

Descriptors: (*Beryllium, *Tensile properties), Ductility, Heat treatments, High temperature, Medium temperature, Metallography, Rolling, Ruptures, Sheets, Strain hardening.

For abstract, see NSA 29 07, number 16251.

RFP-2091 PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
INGOT BERYLLIUM-MICROSTRUCTURAL AND MECHANICAL PROPERTY CHANGES DURING CAN-ROLLING.
C. R. Heiple, and L. F. Dolechek. 21 Dec 73, 12p
Contract AT(29-1)-1106

Descriptors: (*Beryllium, *Mechanical properties), (*Stainless steel-304, Mechanical properties), Canning, Grain refinement, Microstructure, Recrystallization, Rolling, Very high temperature.

For abstract, see NSA 29 07, number 16252.

8GAE-2158 PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf.
COMPARISON OF OUTGASSING RATES FROM STAINLESS STEEL, ALUMINUM, AND COPPER AFTER BAKEOUT UNDER HIGH VACUUM AND ATMOSPHERIC PRESSURE.
R. Dobrozemsky, and G. Moraw. Aug 73, 13p
CONF-730954-1
U.S. Sales Only.

Descriptors: (*Stainless steels, *Degassing), (*Aluminium, Degassing), (*Copper, Degassing), Baking, Medium pressure, Medium temperature, Pressure dependence, Time dependence, Ultrahigh vacuum, Vacuum systems.

For abstract, see NSA 29 07, number 18011.

SLA-73-568 PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
THERMAL COMPRESSION BONDING OF COPPER.
R. T. Sylvester, and C. E. Albright. Jul 73, 21p

Descriptors: (*Copper, *Bonding), Foils, Hot pressing.

For abstract, see NSA 29 07, number 18012.

WAPD-TM-1095 PC$4.00/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
EFFECT OF POST-IRRADIATION ANNEALING AND RE-IRRADIATION ON THE FRACTURE PROPERTIES OF A302B PRESSURE VESSEL STEEL.
J. F. Hall, and D. J. Seman. Jul 73, 39p
Contract AT(11-1)-GEN-14

Descriptors: (*Steel-astm-a302, *Physical radiation effects), (*Pressure vessels, Steel-astm-a302), Annealing, Fracture properties, Neutron beams, Transition temperature.

For abstract, see NSA 29 07, number 16346.

11G. Miscellaneous Materials

N74-17200/8GA PC$4.00/MF$1.45
Saes Getters S.p.A., Milan (italy).
A NON-EVAPORABLE GETTER FOR LOW TEMPERATURES.
A. Barosi, and T. A. Giorgi. 1972, 10p TR-25

Descriptors: *Chemisorption, *Getters, *Surface properties, *Zirconium, Activation, Graphite, Metal powder, Porosity, Room temperature, Sintering, Vacuum systems.

For abstract, see STAR 1208

11H. Oils, Lubricants, and Hydraulic Fluids

AD-776 535/7GA PC$4.00/MF$1.45
Naval Air Propulsion Test Center Trenton N J
EVALUATION OF MIL-L-23699 LUBRICATING OIL PERFORMANCE IN THE J79 ENGINE.
Final rept.,
Frank Feinberg. Mar 74, 18p Rept no. NAPTC-PE-39

Descriptors: *Airplane engine oils, *Turbojet engines, Performance(Engineering), Viscosity, Corrosion, Oxidation.
Identifiers: J-79-GE-10 engines, J-79 engines.

An evaluation was made of the service performance characteristics of MIL-L-23699B oils in the J79 engine. Operational experience and problems, lubricant condition, and the condition of lubricant wetted engine components at overhaul are discussed. Recommendations are made concerning the expected life of MIL-L-23699 oils in this engine. (Author)

N74-17194/3GA PC$10.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
INVESTIGATIONS ON ELASTOHYDRODYNAMICAL LUBRICATION FILM THICKNESS FOR ELLIPTICAL HERTZ CONTACT SURFACES.
Ph.D. Thesis.
P. Bruester. Jan 74, 140p NASA-TT-F-15215
Contract NASW-2483
Tran-Transl. Into English from Universitat Carolo-Wilhelmina Zu Braunschweig Zur Erlangung der Wuerde Eines Doktor-Ingenieurs Dissertation, Braunschweig, West Germany, 144 p.

Descriptors: *Cylindrical bodies, *Film thickness, *Lubricating oils, *Surface layers, Elastohydrodynamics, Electrical resistance, Roller bearings, Sliding friction.

For abstract, see STAR 1208

PAT-APPL-334 318 PC$5.25/MF$1.45
Department of Agriculture, Washington, D.C.
N-SUBSTITUTED FATTY ACID AMIDE LUBRICANTS.
Patent Application.
Frank. C. Magne, Robert R. Mod, Gene Sumrell, and Winfred E. Parker. Filed 21 Feb 73, 41p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Morpholines, *Amides, *Extreme pressure lubricants, Synthesis(Chemistry), Fatty acids, Additives, Performance evaluation, Thioamides.
Identifiers: PAT-CL-260-402-500.

The patent application relates to N-acylmorpholines and N-mono and N,N-disubstituted fatty acid amides and to similar derivatives of epithioamides which are useful as base and extreme pressure lubricants and additives.

PAT-APPL-348 802 PC$4.25/MF$1.45
Department of Agriculture, Washington, D.C.
N-SUBSTITUTED FATTY ACID AMIDE LUBRICANTS.
Patent Application,
Frank C. Mange, Robert M. Mod, Gene Sumrell, and Winfred E. Parker. Filed 6 Apr 73, 21p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Extreme pressure lubricants, *Morpholines, *Amides, *Thioamides, Wear inhibitors, Extreme pressure additives, Fatty acids, Synthesis(Chemistry), Sulfur heterocydic compounds, Aliphatic compounds.
Identifiers: PAT-CL-260-402-500.

The patent application relates to N-acylmorpholines and N-mono and N,N-disubstituted fatty acid amides and to similar derivatives of epithioamides which are useful as base and extreme pressure lubricants and additives.

11I. Plastics

AD-776 326/1GA PC$3.00/MF$1.45
Brown Univ Providence R I Engineering Materials Research Lab
16-YEAR CREEP OF POLYETHYLENE AND PVC.
W. N. Findley, and J. F. Tracy. Nov 73, 15p Rept nos. MRL-E-88, EMRL-57
Contract DAHC15-67-C-0217

Descriptors: *Polyethylene, *Polyvinyl chloride, *Creep, Mathematical models, Predictions.

Creep tests at constant stress, temperature and relative humidity for two thermoplastics were conducted for approximately 132 000 hr. The strains epsilon for the first 2000 hr. of time t were described by an equation of the form epsilon = (epsilon sup 0) + (epsilon sup +)(t sup n). This equation was found to predict the creep of PVC for approximately 132 000 hr. with reasonable accuracy. The predicted strains for polyethylene were somewhat low. Strains during unloading and reloading after 90 000 hr. of creep were predicted reasonably well by the Boltzmann superposition principle. (Author)

AD-776 449/1GA Reprint
National Bureau of Standards Washington D C Inst for Materials Research
THE EFFECT OF DILUTE FLUORINE ON CERTAIN FLUOROPOLYMERS,
Daniel W. Brown, ROLAND E. Florine, and Leo A. Wall. 1973, 14p AROD-2703.16-C
Availability: Pub. in Applied Polymer Symposium, n22 p169-180 1973.

Descriptors: *Fluorination, *Degradation, *Fluorohydrocarbons, Fluorine, Polymers, Viscosity, Crosslinking(Chemistry).
Identifiers: Tetrafluoroethylene resins, Chemical reaction mechanisms.

Various fluoropolymers were exposed to 5% fluorine in helium at 25C and one atmosphere. About 10-100% as many fluorine molecules were charged as monomer units in each polymer. Certain polymers degraded by decreases in their intrinsic viscosities. The intrinsic viscosity of polyperfluoropropene was not changed. Other polymers cross-linked by formation of gel. (Modified author abstract)

AD-776 531/6GA Reprint
Pennsylvania Univ Philadelphia Lab for Research on the Structure of Matter
A THEORY FOR ENVIRONMENTAL CRAZE YIELDING OF POLYMERS AT LOW TEMPERATURES,
Norman Brown. 21 May 73, 15p AROD-9051.3-MC
Grant DA-ARO-D-31-124-73-G63
Revision of report dated 21 Mar 73.
Availability: Pub. in Jnl. of Polymer Science, v11 p2099-2111 1973.

Descriptors: *Polymers, *Crazing, Nitrogen, Argon, Nucleation, Stresses, Strain rate.

It has been recently discovered that polymers craze at low temperatures in the presence of nitrogen or argon. A quantitative theory has been developed which explains (1) the critical temperature above which the phenomenon disappears, (2) the critical stress for nucleating a craze, (3) the effect of strain rate on the yield point and size of crazes, (4) the drop in the load during craze yielding, and (5) the increase in strength of the polymer in N2 or Ar at high strain rates so that the ultimate strength may exceed that in He or vacuum. The crazing action of the gases is described qualitatively at the molecular level. (Author)

AD-776 557/1GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PREDICTING THE DURABILITY OF WELDED JOINTS OF THERMOPLASTIC FILMS,
M. G. Dodin, and S. B. Ratner. 7 Nov 73, 7p Rept no. FSTC-HT-23-1665-72
Trans. of Plasticheskie Massy (USSR) n4 p68-70 1969.

Descriptors: *Bonded joints, *Polymers, Numerical analysis, Predictions, Polyethylene, Polyvinyl chloride, Translations, USSR.

The investigations were conducted on films of crystalline low density polyethylene (PE n.p.) and amorphous polyvinyl chloride (PVC). The durability of welded joints was determined on a special device, at a temperature of from 20-70C. The tests were conducted in a regime of constant stress on the test object, which was in the form of a belt with a width of 10 mm. The conditions of the experiment varied in such a way that the durability changed by 5-6 orders of magnitude. Equations were devised by which mechanical durability could be predicted.

AD-776 922/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A DUET OF METAL AND PLASTIC,
A. Ivakhnov. 25 Mar 74, 6p Rept no. FTD-HT-23-1250-74
Edited trans. of Izvestiya (USSR) n252 p3, 26 Oct 73, by Charles T. Ostertag, Jr.

Descriptors: *Polymers, Metals, Organic coatings, Machines, Translations, USSR.

AD-776 947/4GA PC$3.00/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
THE EFFECT OF IODINE ON THE MATERIAL PROPERTIES OF PACKAGING POLYMERS.
Final rept.,
Frederick J. Dechow, and Nathaniel S. Schneider. Dec 73, 17p Rept no. AMMRC-TR-73-55

Descriptors: *Packaging, *Polymeric films, *Iodine, Iodides, Permeability, Water treatment, Sorption, X ray diffraction.

Films of nine polymers were examined to determine any changes in their physical and mechanical properties after exposure to solutions of iodine and potassium iodide. The sorption and permeability of iodine for the films were measured at temperatures of 105F and 140F. These films were also analyzed by X-ray diffraction and by thermomechanical studies. The results are discussed in terms of differences in polymeric repeat units and in terms of crystallinity. Recommendations for future studies are included. (Author)

AD-776 983/9GA PC$3.25/MF$1.45
Case Western Reserve Univ Cleveland Ohio
MORPHOLOGY OF AMORPHOUS POLYMERS.
Final rept.,
Phillip H. Geil. Nov 73, 49p* Rept no. TR-260
Contract DAHC04-70-C-0032

Descriptors: *Polymers, *Amorphous materials, Morphology, Crystal structure, Electron microscopy, Annealing, Deformation, Physical properties.
Identifiers: Polycarbonate resins.

Recent morphological research has indicated that a number of amorphous polymers consist of small, liquid-crystal-like domains. Annealing below Tg can cause a change in size of the ca. 100A diameter domains and their internal order. These results and related evidence for local order in polymer melts and solutions are reviewed, followed by consideration of the effect of the domain structure on the physical properties of a specific polymer, polycarbonate, and the relationship of this structure to the concept of free volume. (Author)

N74-17295/8GA PC$4.50/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Automatique.
MECHANISMS OF RADIATION DAMAGE IN POLYMERS.
A. Paillous. 1973, 29p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Plastics, *Polymer physics, *Radiation damage, *Space environment simulation, Degradation, Electron irradiation, Photolysis, Proton irradiation, Radiolysis, Ultraviolet radiation.

For abstract, see STAR 1208

PAT-APPL-288 814 PC$5.00/MF$1.45
Department of Agriculture, Washington, D.C.
N, N-DI-N-BUTYL-2-(OLEOYLOXY) PROPIONAMIDE.
Patent Application,
Robert R. Mod, Frank C. Magne, and Evald L. Skau. Filed 13 Sep 72, 39p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Plasticizers, *Amides, Vinyl chloride resins, Antistatic agents, Synthesis(Chemistry), Thermal stability.
Identifiers: PAT-CL-260-404, *Oleamides.

The patent application provides symmetrical N,N-dialkyl-2-(oleoyloxy) propionamide, wherein the total number of carbons in the two alkyl groups is from 6 to 14, which is useful as a plasticizer for vinyl chloride resins.

PAT-APPL-400 079 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
EPITHIOAMIDES AS PLASTICIZER-STABILIZERS.
Patent Application,
Frank C. Magne, Robert R. Mod, and Gene Sumrell. Filed 24 Sep 73, 4p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Stabilizers(Agents), *Plasticizers, *Sulfur heterocyclic compounds, Synthesis(Chemistry), Soybean oil, Vinyl chloride resins, Vinyl chloride copolymers, Morpholines, Amides.
Identifiers: PAT-CL-260-405-5.

N-(9,10-epithiostearoyl)morpholine, N,N-dibutyl-9-10-epithiostearamide and epithio soybean oil are disclosed in the patent application as thermal-stabilizers for polyvinyl chloride compositions which have better compatibility characteristics with polyvinyl chloride compositions than the analogous epoxides.

PATENT-3 746 683 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
THROMBORESISTANT ARTICLES MADE FROM POLYURETHANES CONTAINING A POLYPROPYLENE GLYCOL-ETHYLENE OXIDE BLOCK COPOLYMER.
Patent,
Ival O. Salyer, and Albert J. Blardinelli. Filed 24 Dec 70, patented 17 Jul 73, 3p PAT-APPL-101 425,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Blood coagulation, *Polyoxypropylene, *Polyoxyethylene, *Polyurethane resins, Containers, Copolymers, Additives, Materials handling equipment.
Identifiers: PAT-CL-260-33-2-R.

The patent relates to articles useful in handling blood and reducing clotting as compared to articles made from conventional polyurethanes. Thromboresistance is imparted by a polymer additive which is a polyethylene glycol, a polypropylene glycol or a block copolymer of the two glycol units.

RL-73-114 PC$3.25/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
WEIBULL'S FAILURE THEORY APPLIED TO AN EPOXY RESIN.
B. Colyer. Oct 73, 21p
U.S. Sales Only.

Descriptors: (*Epoxides, *Stress analysis), Distribution functions, Fractures, Mathematical models, Medium temperature, Reliability, Ruptures, Stresses, Superconducting magnets, Ultralow temperature.

For abstract, see NSA 29 07, number 17086.

UCID-16412 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
PREPARATION AND TESTING OF URETHANE POLYMER RINGS.
A. T. Buckner, E. S. Jessop, and H. G. Hammon. 6 Nov 73, 8p

Contract W-7405-eng-48

Descriptors: (*Polyurethanes, *Cutting), (*Rings, *Materials testing), Cutting tools, Tensile properties.

For abstract, see NSA 29 07, number 18016.

11J. Rubbers

PAT-APPL-365 899 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
PYROLYZED ROSIN PRODUCTS AS SYNTHETIC RUBBER TACKIFIERS.
Patent Application,
Ray F. Severson, Walter H. Schuller, and Ray V. Lawrence. Filed 1 Jun 73, 13p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Rosin, *Styrene butadiene resins, Synthetic elastomers, Adhesion, Additives, Pyrolysis.
Identifiers: PAT-CL-424-308.

The patent application relates to Styrene-butadiene synthetic rubber compositions of enhanced building tack from a content therein of from 1 to 15 phr (parts rosin derivative per hundred parts rubber) of pyrolyzed wood rosin and various pyrolyzed vacuum distillation cuts of a wood rosin.

PATENT-3 714 087 Not available NTIS
Department of Agriculture, Washington, D.C.
POWDERED RESORCINOL-FORMALDEHYDE TREATED POLYSACCHARIDE-REINFORCED ELASTOMER MASTERBATCHES, COMPOUNDS, AND RESULTING VULCANIZED RUBBERS.
Patent,
Russell A. Buchanan, and Charles R. Russell. Filed 28 Feb 72, patented 30 Jan 73, 8p PAT-APPL-230 098,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polysaccharides, *Vulcanized elastomers, *Powder(Particles), Molding techniques, Precipitation(Chemistry), Grinding(Comminution), Xanthates, Resorcinols, Styrene butadiene resins, Vulcanized elastomers, Curing.
Identifiers: PAT-CL-260-17-2.

The patent describes powdered elastomer masterbatches which are prepared by grinding dried rubber curds which contain highly effective polysaccharide reinforcing agents. Such finely comminuted elastomer masterbatches provide stable powdered rubber compounds when blended with usual powdered curatives and fine particle fillers. These powdered rubber compounds are formed into finished vulcanized rubber articles by direct heat-compression molding, by extrusion from a simple machine, or by injection molding without prior high shear mixing.

11L. Wood and Paper Products

COM-74-50223/8GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
NBS VOLUNTARY PRODUCT STANDARD. PREFINISHED HARDBOARD PANELING.
Feb 74, 11p NBS-PS-59-73 ANSI-A135.5-1973
Paper copy available from GPO $0.45 as C13.20/2:59-73.

Descriptors: *Fiberboards, *Panels, Standards, Dimensional measurement, Tolerances(Mechanics), Mosture content, Physical properties, Finishes.
Identifiers: Hardboards, *Product standards.

The voluntary product standard covers requirements and methods of test for the dimensions, squareness, edge straightness, and moisture content, of prefinished hardboard paneling; for the physical properties of the hardboard substrate; and for the finish of the paneling. Methods of identifying products which conform to the requirements of this Standard are included.

COM-74-50224/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
NBS VOLUNTARY PRODUCT STANDARD. HARDBOARD SIDING.
Feb 74, 10p NBS-PS-60-73 ANSI-A135.6-1973
Paper copy available from GPO $0.40 as C13.20/2:60-73.

Descriptors: *Fiberboards, *Siding, Standards, Dimensional measurement, Tolerances(Mechanics), Physical properties, Weathering, Coatings.
Identifiers: Hardboards, *Product standards.

The voluntary product standard covers requirements and methods of test for the dimensions, straightness, squareness, physical properties, and surface characteristics of hardboard siding. Definitions of trade terms used and methods of identifying products that comply with this Standard are included.

PATENT-3 730 829 Not available NTIS
Department of Agriculture, Washington, D.C.
STARCH XANTHATE DERIVATIVES USED IN PAPERMAKING.
Patent,
George G. Maher. Filed 18 Oct 71, patented 1 May 73, 8p PAT-APPL-190 319,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Papermaking, *Forms(Paper), *Epoxy compounds, Starches, Crosslinking, Xanthates.
Identifiers: PAT-CL-162-175, *Starch xanthate.

This invention relates to the preparation of molded articles and films having properties which vary from hard and brittle to soft and pliable. More specifically, the invention relates to products prepared from crosslinked starch xanthate. A method of preparing paper is disclosed which includes the step of adding to the paper pulp the products of the reaction of starch xanthate with either an alkyl diglycidal ether or an alkyl diepoxide to thus increase, burst, wet and dry strength and fold endurance of the paper. This reaction may take place ex or in situ.

PATENT-3 763 060 Not available NTIS
Department of Agriculture, Washington, D.C.
STARCH XANTHATE-POLYAMIDE-POLYAMINE INTERPOLYMER PAPER STRENGTH ADDITIVES.
Patent,
George Earle Hammerstrand, and Merle E. Carr. Filed 9 Jun 72, patented 2 Oct 73, 5p PAT-APPL-261 496,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Papermaking, *Polyamide resins, *Polyamines, Tensile strength, Additives, Mechanical properties, Bursting strength, Dry strength, Wet strength, Crosslinking, Copolymers, Epichlorohydrin.
Identifiers: PAT-CL-260-9, *Starch xanthate.

Crosslinked starch-polyamide-polyamine interpolymers are prepared and described in the patent. Wet- and dry-tensile, dry-burst, and concora crush strengths of paper products, prepared from both acid and alkaline pulp furnishes, are significantly increased by the wet-end addition of the interpolymers.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-776 315/4GA PC$3.25/MF$1.45
Aerospace Research Labs Wright-Patterson AFB Ohio
ON THE EXACT DISTRIBUTIONS OF THE TEST STATISTICS BASED ON THE EIGENVALUES OF COMPLEX RANDOM MATRICES.
Technical rept.,
P. R. Krishnaiah. Dec 73, 26p Rept no. ARL-73-0178

Descriptors: *Statistical tests, *Distribution functions, *Multivariate analysis, Matrices(Mathematics), Sampling, Time series analysis.
Identifiers: Eigenvalues, Wishart matrices.

In the report, the author considers the derivation of the exact noncentral distributions of certain test statistics based upon the eigenvalues of a class of complex random matrices. This class of random matrices include Wishart matrix, MANOVA matrix, canonical correlation matrix and the two-sample covariance model matrix in the complex case. The moments of the elementary symmetric functions as well as the Laplace transformations of the traces of the above class of random matrices are derived. Also, the exact distributions of any few roots as well as the distributions of certain ratios of the roots of the above class of random matrices are derived. In addition, the exact noncentral distribution of the trace of the complex MANOVA matrix is derived. (Author)

AD-776 391/5GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J
LEAST-SQUARES FITTING OF POLYNOMIAL EQUATIONS. THE INTERACTIVE PROGRAM POLYFIT.
Technical rept.,
Thomas E. Hayes, and George D. Six. Feb 74, 17p Rept no. PA-TR-4558

Descriptors: *Curve fitting, *Least squares method, *Computer programs, Polynomials, Time sharing, FORTRAN.
Identifiers: POLYFIT computer program, CDC 6500 computers.

A program, POLYFIT, has been converted to CDC FORTRAN Extended that provides true least-squares fits to bivariate data of equations of the form: y = (A sub 0) + (A sub 1)x + . . . + (A sub m)(x sub m).

AD-776 392/3GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J
ROOT DETERMINATION OF POLYNOMIAL EQUATIONS WITH REAL COEFFICIENTS.
Technical rept.,
Meir Baran, and George D. Six. Jan 74, 16p Rept no. PA-TR-4591

Descriptors: *Computer programs, *Equations, Polynomials, FORTRAN.
Identifiers: CDC 6500 computers, *Roots of equations, *Theory of equations.

A program has been written in CDC FORTRAN EXTENDED that provides the solution of polynomial equations of any degree with real coefficients of the form: y sup n + (A sub 1) y sup (n-1) + (A sub 2) y sup (n-2) + . . . + (A sub n) = 0. The program has been included in the permanent files of the Picatinny Arsenal CDC-6500 computer and may be accessed and used from any teletype connected to that facility. An explanation of the use of the program, an explanation and derivation of the mathematics on which it rests, and a listing of the program, in CDC FORTRAN EXTENDED are included in the report. (Modified author abstract)

AD-776 423/6GA Reprint
California Univ Berkeley Dept of Statistics
ANOTHER NOTE ON THE BOREL-CANTELLI LEMMA AND THE STRONG LAW, WITH THE POISSON APPROXIMATION AS A BY-PRODUCT,
David Freedman. 5 Apr 73, 19p AFOSR-TR-74-0223
Grant AF-AFOSR-2100-71
Revision of report dated 20 Aug 72.
Availability: Pub. in The Annals of Probability, v1 n6 p910-925 1973.

Descriptors: *Probability, *Inequalities, Random variables, Set theory, Measure theory, Theorems.
Identifiers: Borel-Cantelli theorem.

The paper presents another way to prove Levy's conditional form of the Borel-Cantelli lemmas, and his strong law. Consider a sequence of dependent variables, each bounded between 0 and 1. Then the sum S of the variables tends to be close to the sum T of the conditional expectations. Indeed, the chance that S is above one level and T is below another is exponentially small. So is the chance that S is below one level and T is above another. The inequalities also show that for a sequence of dependent events, such that each has uniformly small conditional probability given the past, and the sum of the conditional probabilities is nearly constant at a, the number of events which occur is nearly Poisson with parameter a. (Author)

AD-776 424/4GA Reprint
Florida Univ Gainesville Dept of Mathematics
ALGEBRAIC STRUCTURE OF LINEAR DYNAMICAL SYSTEMS. III. REALIZATION THEORY OVER A COMMUTATIVE RING,
Yves Rouchaleau, Bostwick F. Wyman, and R. E. Kalman. 14 Sep 72, 6p AFOSR-TR-74-0264
Grant AF-AFOSR-2268-72
See also AD-654 828.
Availability: Pub. in Proceedings of The National Academy of Sciences, v69 n11 p3404-3406 Nov 72.

Descriptors: *Matrices(Mathematics), *Linear systems, *Rings(Mathematics), Theorems.

The realization theory linear dynamical systems, previously developed over a field, are extended to a large class of commutative rings. The principal result is that the existence criterion for a finite realization extends without modification from a field to a Noetherian integral domain. (Author)

AD-776 441/8GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Mathematics
ON THE NONLINEAR METHOD OF WILKINS FOR COOLING FIN OPTIMIZATION,
S. Bhargava, and R. J. Duffin. 8 Aug 72, 10p
AROD-9300.12-M
Grant DA-ARO-D-31-124-71-G17
Revision of report dated 22 Feb 72.
Availability: Pub. in SIAM Jnl. Applied Mathematics, v24 n4 Jun 73.

Descriptors: *Nonlinear differential equations, Inequalities, Functional analysis, Numerical integration, Heat exchangers.

AD-776 473/1GA Reprint
California Univ Santa Barbara Dept of Mathematics
(0,1)-MATRICES WITH MINIMAL PERMANENTS,
Henryk Minc. 2 Oct 72, 5p AFOSR-TR-74-0250
Grant AF-AFOSR-2164-72
Availability: Pub. in Israel Jnl. of Mathematics, v15 n1 p27-30 1973.

Descriptors: *Matrices(Mathematics), Permutations, Theorems.

It is shown that the permanent of a totally indecomposable (0,1) - matrix is equal to its largest row sum if and only if all its other row sums are 2. (Author)

AD-776 485/9GA Reprint
Belfer Graduate School of Science New York
PIECEWISE MONOTONE POLYNOMIAL APPROXIMATION,
D. J. Newman, Eli Passow, and Louis Raymon. 8 Sep 71, 11p AFOSR-TR-74-0327
Grant AF-AFOSR-1736-69
Prepared in cooperation with Yeshiva Univ., N.Y. Dept. of Mathematics and Temple Univ., Philadelphia, Pa. Dept. of Mathematics.
Availability: Pub. in Transactions of the American Mathematical Society, v172 p465-472 Oct 72.

Descriptors: *Polynomials, *Approximation, Functions(Mathematics), Theorems.
Identifiers: Monotone functions.

Given a real function f satisfying a Lipschitz condition of order 1 on (a,b) there exists a sequence of approximating polynomials (P sub n) such that the sequence (E sub n) = 11 (P sub n) - f 11 (sup norm) has order of magnitude. The authors investigate the possibility of selecting polynomials (P sub n) having the same local monotonicity as f without affecting the order of magnitude of the error. (Modified author abstract)

AD-776 493/9GA Reprint
Belfer Graduate School of Science New York
MUNTZ-JACKSON THEOREMS IN L SUP P ((0,1) AND C (0, 1),
Joseph Bak, and Donald J. Newman. 11 Aug 71, 22p AFOSR-TR-74-0330
Grant AF-AFOSR-1736-69
Prepared in cooperation with City Coll., New York.
Availability: Pub. in American Jnl. of Mathematics, v94 n2 p437-457 Apr 72.

Descriptors: *Approximation, Polynomials, Integral transforms, Numerical integration, Set theory, Theorems.
Identifiers: Muntz-Jackson theorem.

The paper addresses the application of Muntz-Jackson theorems to problems of (L sup p) (0,1) and C(0,1) spaces. (Author)

AD-776 495/4GA Reprint
Utah Univ Salt Lake City Dept of Mathematics
PERIODIC SOLUTIONS OF HEREDITARY DIFFERENTIAL SYSTEMS,
G. B. Gustafson, and Klaus Schmitt. 24 Aug 72, 22p AROD-9157.7-M
Grant DA-ARO-D-31-124-72-G56
Availability: Pub. in Jnl. of Differential Equations, v13 n3 p567-587 Ma7 73.

Descriptors: *Differential equations, *Periodic functions, Topology, Set theory, Theorems.

The purpose of the paper is to establish the existence of T-periodic solutions of the following hereditary differential systems: x'(t) = -F(Ux(t)) + f(t), x'(t) = -A(t) Ux(t)(0) + f(t), x'(t) = -F(t, Ux(t)) + f(t), x'(t) = -F(t, Ux(t)) + g(t, xt, U*xt), x double prime (t) = h(t, x(t), x(t - d(t, x(t)))). U* is an operator of the same type as U the equations are listed in increasing order of complexity. (Modified author abstract)

AD-776 496/2GA Reprint
Belfer Graduate School of Science New York
AN EXTREMAL PROBLEM FOR THE GEOMETRIC MEAN OF POLYNOMIALS,
E. Beller, and D. Newman. 9 Oct 72, 6p AFOSR-TR-74-0369
Grant AF-AFOSR-1736-69
Prepared in cooperation with Newark Coll. of Engineering, N.J. Dept. of Mathematics. Revision of report dated 22 May 72.
Availability: Pub. in Proceedings of the American Mathematical Society, v39 n2 p313-317 Jul 73.

Descriptors: *Polynomials, *Inequalities, Complex numbers, Theorems.

AD-776 500/1GA Reprint
North Carolina Univ Chapel Hill Dept of Statistics
THE REPRESENTATION OF STOCHASTIC PROCESSES WITHOUT LOSS OF INFORMATION.
Interim rept.,
Stamatis Cambanis, and Elias Masry. 12 Oct 72, 9p AFOSR-TR-74-0370
Grant AF-AFOSR-1415-68
Prepared in cooperation with California Univ., San Diego, La Jolla. Dept. of Applied Physics and Information Science under Contract N00014-69-A-0200-6037. Revision of report dated 14 Mar 72.
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v25 n4 p628-633 Dec 73.

Descriptors: *Stochastic processes, Measure theory, Set theory, Theorems.

The note considers the problem of representing a continuous parameter stochastic process (x(t, omega)t belongs to T) by a sequence of random variables ((xi sub n)(omega))sub n without loss of information. The random variables are obtained in terms of linear integral operations on the sample paths of the process. A class of stochastic processes for which such a representation is possible is given in another paper. It is shown here that two new broad classes of stochastic processes admit such a representation. The first is the class of second order, continuous in probability stochastic processes. The second is the class of weakly continuous stochastic processes. It is further shown that these three classes are distinct. (Author)

AD-776 503/5GA Reprint
California Univ Los Angeles
BOUNDED POLYHARMONIC FUNCTIONS AND THE DIMENSION OF THE MANIFOLD,
Norman Mirsky, Leo Sario, and Cecilia Wang. 6 Nov 72, 9p AROD-9653.43-M
Grant DA-ARO-D-31-124-73-G39
Availability: Pub. in Jnl. of Math. Kyoto Univ., v13 n3 p529-535 1973.

Descriptors: *Potential theory, Harmonic analysis.
Identifiers: *Harmonic functions, Laplace equation.

AD-776 516/7GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa
DUAL EXTREMUM PRINCIPLES RELATING TO COOLING FINS,
S. Bhargava, and R. J. Duffin. 21 Feb 72, 17p AROD-9300.10-M
Grant DA-ARO-D-31-124-71-G17
Availability: Pub. in Quarterly of Applied Mathematics, v31 n1 Apr 73.

Descriptors: *Partial differential equations, Functional analysis, Heat exchangers, Mathematical models.
Identifiers: Sturm-Liouville equation.

AD-776 521/7GA Reprint
Rutgers - the State Univ New Brunswick N J
EQUATIONS WITH BOUNDED NONLINEARITIES,
Jane Cronin. 8 Jan 73, 18p AROD-6131.16-M
Grant DA-ARO-D-31-124-G69
Availability: Pub. in Jnl. of Differential Equations, v14 n3 p581-596 Nov 73.

Descriptors: *Partial differential equations, *Nonlinear differential equations, Functional analysis, Banach space, Topology, Theorems.
Identifiers: Elliptic differential equations.

In two recent papers, Nirenberg has studied a very wide class of nonlinear elliptic equations by introducing two general techniques. The first of these techniques can be described roughly as follows: If the linear part of a functional equation is a Fredholm operator and if the nonlinear part of the functional equation is compact and suitably

bounded then the Lyapunov-Schmidt technique can be used to solve the functional equation. The purpose here is first (Section 1) to describe Nirenberg's technique in abstract form.

AD-776 524/1GA Reprint
California Inst of Tech Pasadena
INDETERMINATES AND INCIDENCE MATRICES,
H. J. Ryser. 20 Jun 72, 11p AROD-8226.4-M
Contract N00014-67-A-0094-0010, Grant DA-AROD)-31-124-G1138
Availability: Pub. in Linear and Multilinear Algebra, v1 p149-157 1973.

Descriptors: *Matrices(Mathematics), Polynomials, Theorems.

The author develops some of the basic properties of formal incidence matrices. The author also summarizes some recent investigations on matrices whose elements are linear forms in t independent indeterminates over a field F. The results are of interest both from the algebraic and combinatorial points of view. (Author)

AD-776 568/8GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
A FORMAL TRANSFORMATION OF A SYSTEM OF LINEAR DIFFERENTIAL EQUATIONS,
K. A. Abgaryan. 3 Dec 73, 17p Rept no. FSTC-HT-23-2075-72
Trans. of Akademiya Nauk Armyanskoi SSR, Erevan. Izvestiya. Matematika, v7 n4 p317-326 1970.

Descriptors: *Differential equations, *Transformations(Mathematics), Matrices(Mathematics), Theorems, Translations, USSR.

AD-776 569/6GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
EMPIRICAL METHOD OF SOLVING AN INTEGRAL EQUATION IN VISCO-ELASTICITY THEORY,
A. A. Ilyushin. 20 Dec 73, 6p Rept no. FSTC-HT-23-2445-72
Trans. of Mekhanika Polimerov (USSR) n4 p584-587 1969.

Descriptors: *Viscoelasticity, *Integral equations, *Polymers, Creep, Sampling, Translations, USSR.

The paper presents the development of a method of improving the convergence of Il'yushin's method of approximations based on representing the relation between the solutions of problems in viscoelasticity theory and Poisson ratio in terms or rational functions, and on the combined use of creep and relaxation functions obtained experimentally. The method proposed consists in solving an integral equation in viscoelasticity theory on the basis of creep tests performed with a polymer sample containing an elastic element as an inclusion.

AD-776 689/2GA Reprint
Virginia Univ Charlottesville
SOME PROBLEMS IN THE SPECTRAL THEORY OF STATIONARY PROCESSES ON (R SUP D),
Loren D. Pitt. 30 Jan 73, 25p AROD-5306.44-M
Grant DA-ARO-D-31-124-G1005
Prepared in cooperation with University of Southern California, Los Angeles.
Availability: Pub. in Indiana Univ. Mathematics Jnl., v23 n4 p343-365 1973.

Descriptors: *Stochastic processes, Set theory, Approximation, Spectra, Theorems.
Identifiers: Stationary processes, Markov processes.

The author considers the d-dimensional Euclidean space (R sup d) and a centered, complex-valued, stochastically continuous process (X sub t : t belongs to R sup d) that is wide-sense stationary in that the covariance function E(X sub t)X ave (sub s) is assumed to be a function rho(t - s) of the difference t - s. (Author)

AD-776 691/8GA Reprint
North Carolina Univ Chapel Hill
WAITING TIME PARADOXES AND ORDER STATISTICS,
H. A. David. Mar 73, 5p AROD-2776.87-M
Grant DA-ARO-D-31-124-70-G6
Revision of report dated Jun 72.
Availability: Pub. in Jnl. of the American Statistical Association, v68 n343 p743-745 Sep 73.

Descriptors: *Life tests, *Queueing theory, Distribution functions, Failure.
Identifiers: *Order statistics.

It is well known that we tend to have to wait longer than we expect. Special cases of this paradox have been discussed by Feller and by Zelen. Here the paradox is further explored, and generalizations are considered to describe the effect of the observer on the expected length of an interval between successive events in a life test. (Author)

AD-776 694/2GA Reprint
Pembroke State Univ N C
ENUMERATION OF FINITE TOPOLOGIES,
Kim Ki-Hang Butler, and George Markowsky. 1973, 18p AROD-11340.2-M
Grant DA-ARO-D-31-124-73-G114
Prepared in cooperation with Harvard Univ., Cambridge, Mass.
Availability: Pub. in Proceedings of the Southeastern Conference on Combinatorics, Graph Theory and Computing (4th), Florida Atlantic Univ.,, Boca Raton, March 5-8, 1973 p169-184 1973.

Descriptors: *Topology, Combinatorial analysis, Set theory, Theorems.

Let X be a set with n elements. The number of topologies that can be defined on X has been determined for certain small values of n. Also, the number of topologies defined on n points has been estimated by several authors. In the paper, the authors present some formulas relating to these topics.

AD-776 704/9GA Reprint
North Carolina State Univ Raleigh Dept of Mathematics
ON NONLINEAR TIME-DEPENDENT MULTIVELOCITY TRANSPORT EQUATIONS,
C. V. Pao. Dec 73, 22p AROD-10647.24-M
Grant DA-ARO-D-31-124-72-G192
Availability: Pub. in Jnl. of Mathematical Analysis Applications, v44 n3 p725-744 Dec 73.

Descriptors: *Neutron transport theory, *Nonlinear differential equations, Boltzmann equation, Theorems.
Identifiers: Existence theorems, Uniqueness theorems.

The aim of the paper is to show the existence and uniqueness of a solution for a class of nonlinear multivelocity neutron transport equations and to present a method for the determination of the solution. A recursion formula for the construction of a solution by the method of successive approximations and an error estimate for approximate solutions are given. Both global and local solutions are discussed. The conditions imposed on the nonlinear equation are directly applicable to the linear multivelocity transport problem, and a recursion formula for this system is also given. In the process of approximations, only sucessive integrations are involved. This fact indicates a promising possibility for the calculation of numerical results by using a computer. A brief discussion of this possibility and the applicability of the results on nonlinear problems are included. (Author)

AD-776 707/2GA Reprint
Los Alamos Scientific Lab N Mex
AN ALGORITHM FOR THE EXACT REDUCTION OF A MATRIX TO FROBENIUS FORM USING MODULAR ARITHMETIC. PARTS I AND II,
Jo Ann Howell. 22 Aug 72, 36p AROD-3772.83-M
Grants DA-ARO-D-31-124-72-G34, NSF-GP-23655
Availability: Pub. in Mathematics of Computation, v27 n124 p887-920 Oct 73.

Descriptors: *Matrices(Mathematics), *Transformations(Mathematics), Arithmetic, Number theory, Theorems.
Identifiers: Frobenius theorem.

The paper is in two parts. Part 1 contains a description of the Danilewski algorithm for reducing a matrix to Frobenius form using rational arithmetic. This algorithm is modified for use over the field of integers modulo p. The modified algorithm yields exact integral factors of the characteristic polynomial. A description of the single-modulus algorithm is given. Part 2 contains a description of the multiple-modulus algorithm. Since different moduli may yield different factorizations, an algorithm is given for determining which factorizations are not correct factorizations over the integers of the characteristic polynomial. (Modifed author abstract)

AD-776 722/1GA Reprint
Iowa Univ Iowa City Dept of Mathematics
A SECOND ORDER NONLINEAR OSCILLATION THEOREM,
James S. W. Wong. 27 Dec 72, 7p AROD-10342.4-M
Grant DA-ARO-D-31-124-72-G95
Availability: Pub. in Proceedings of the American Mathematical Society, v40 n2 p487-491 Oct 73.

Descriptors: *Nonlinear differential equations, Oscillation, Numerical integration, Theorems.

An oscillation criterion is given for the second order nonlinear equation (x double prime) + alt)((absolute value of x) to the gamma power) sgn x=0, gamma > 1, where the coefficient a(t) is not assumed to be nonnegative for all large values of t. (Author)

AD-776 724/7GA Reprint
California Inst of Tech Pasadena Dept of Mathematics
VARIANTS OF CYCLIC DIFFERENCE SETS,
H. J. Ryser. 20 Feb 73, 8p AROD-8226.7-M
Grants DA-ARO-D-31-124-72-G171, NSF-GP-36230
Availability: Pub. in Proceedings of the American Mathematical Society, v41 n1 p45-50 Nov 73.

Descriptors: *Set theory, *Matrices(Mathematics), Permutations, Number theory, Theorems.

The paper is an exploratory study of certain rare and intriguing configurations that are almost cyclic difference sets. The variants are of two types. The author gives precise definitions of the variants and then establishes some nonexistence theorems. Only a few examples of the variants are known to us and their complete structure is far from understood. (Author)

AD-776 725/4GA Reprint
Washington Univ St Louis Mo
A SUB-REGULARITY INEQUALITY FOR CONJUGATE SYSTEMS ON LOCAL FIELDS,
Jia-Arng Chao. 5 Apr 72, 10p AROD-3076.34-M
Grant DA-ARO-D-31-124-72-G143
Availability: Pub. in the Studia Mathematica, v54 p249-257 1973.

Descriptors: *Inequalities, *Linear algebra, Harmonic analysis, Measure theory, Theorems.
Identifiers: *Field theory(Algebra).

In the paper a sub-regularity inequality is established for conjugate systems over local fields, from which a classical F. and M. Riesz Theorem can be established. The F. and M. Riesz Theorem referred to is one which identifies a singular integral transformation f maps to (f bar) such that whenever f and (f bar) are both finite Borel measure then each is an (L sup 1) function. These results depend on generalizations of the properties of harmonic and sub-harmonic functions, least harmonic majorants, area integral operators and non-tangential boundary behavior of harmonic functions for local fields. (Author)

AD-776 726/2GA Reprint
Missouri Univ Columbia
ON THE DIFFERENTIAL EQUATION (Y DOUBLE PRIME) + P(X)Y = F(X),
Alexandra Skidmore, and Walter Leighton. 1973, 12p AROD-7593.18-M
Grants DA-ARO-D-31-124-72-G27, DA-ARO(D)-31-124-G1007
Sponsored in part by Grant NSF-GY-8520.
Availability: Pub. in Jnl. of Mathematical Analysis and Applications, v43 n1 46-55 Jul 73.

Descriptors: *Differential equations, *Numerical integration, Theorems, Oscillation.

Oscillatory properties of solutions to (y double prime) + p(x)y = f(x) are considered. (Author)

AD-776 728/8GA Reprint
Rochester Univ N Y
RANKING AND SELECTION PROCEDURES WITH CORRELATED OBSERVATIONS AND SIMULATION,
Edward J. Dudewicz, and Nicholas A. Zaino, Jr. 1973, 8p AROD-10003.10-M
Grant DA-ARO-D-31-124-72-G55
Prepared in cooperation with Ohio State Univ., Columbus.
Availability: Pub. in Proceedings of the Computer Science and Statistics Annual Symposium on the Interface (7th), Statistical Lab., Iowa State Univ., Ames, 1973 p150-155 1973.

Descriptors: *Sampling, *Correlation techniques, Computerized simulation, Population(Mathematics).
Identifiers: *Ranking.

Numerous authors have suggested the use of ranking and selection procedures to set the length of computer simulation runs. However ranking and selection procedures to date have generally assumed the observations are independent; hence, since in simulation the data encountered are often correlated (e.g. within a population through lack of frequent regeneration points, and across populations through use of common random number sequences for various alternatives being simulated) those procedures may not be fully appropriate. In the paper the authors study the effect of correlated data on the sample size (simulation run-length) requirements of a selection procedure, assuming a first-order autoregressive model for the dependence within a population and independence across populations. (Modified author abstract)

AD-776 749/4GA Reprint
Rochester Univ N Y
FURTHER LIGHT ON NONPARAMETRIC SELECTION EFFICIENCY,
Edward J. Dudewicz, and Chung-lien Fan. 1973, 10p AROD-10003.2-M
Grant DA-ARO-D-31-124-72-G55
Prepared in cooperation with Ohio State Univ., Columbus, Contract N00014-68-A-0091.
Availability: Pub. in Unidentified Jnl.

Descriptors: *Sampling, Population(Mathematics).
Identifiers: *Nonparametric statistics.

A nonparametric selection procedure (P sub BS) was proposed by Bechhofer and Sobel (1958) and studied by Dudewicz (1971) in comparison with other procedures under normal and uniform alternatives. They found (P sub BS) always required larger sample sizes, sometimes substantially so. For 2-point populations the authors also find that (P sub BS) may be substantially better than reasonable competitors designed specifically for 2-point populations. Finally, a new nonparametric selection procedure (conjectured to be better than (P sub BS) is proposed. (Modified author abstract)

AD-776 759/3GA PC$21.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
NEARLY BEST LINEAR INVARIANT CONDITIONAL ESTIMATORS OF THE LOCATION AND SCALE PARAMETERS OF THE NORMAL DISTRIBUTION BY USE OF ORDER STATISTICS.
Master's thesis,
Ned H. Criscimagna. Dec 70, 356p Rept no. GRE/MATH/70-1
See also report dated Dec 68, AD-768 387.

Descriptors: *Sampling, *Normal density functions, Probability density functions, Analysis of variance, Estimates, Reliability, Tables(Data), Theses.
Identifiers: *Order statistics, Parameter estimation.

Conditional estimators, based on order statistics, of the location and scale parameters of the normal distribution are developed using the method of Lagrange multipliers. Coefficients are tabulated for nearly best, linear, invariant, conditional estimators. They are designed to be used for samples of size 2 through 40, taken from a population which can be approximated by the normal distribution. The samples may be uncensored singly censored, or doubly censored. Simultaneous estimators may also be obtained using the tables. (Author)

AD-776 760/1GA PC$20.54/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
NEARLY BEST LINEAR INVARIANT CONDITIONAL ESTIMATION OF THE MEAN AND STANDARD DEVIATION OF THE LOGISTIC DISTRIBUTION.
Master's thesis,
John M. Dunigan. Dec 70, 354p Rept no. GRE/MATH/70-3
See also report AD-685 115.

Descriptors: *Sampling, *Distribution functions, Standard deviation, Mean, Estimates, Tables(Data), Theses.
Identifiers: *Logistic density functions, Parameter estimation, Lagrange multipliers, *Order statistics.

The method of Lagrangian Multipliers, based upon the use of order statistics, is used to find the nearly best, linear, invariant, conditional estimators for the mean and standard deviation of the logistic distribution. Coefficients for multiplying ordered logistic statistics are developed for full and censored samples of size N=2(1)40. The censored samples are singly censored from above and symmetrically double censored from each end. The use of the conditional estimation coefficients for simultaneous parameter estimation is shown. (Author)

AD-776 764/3GA PC$31.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
NEARLY-BEST LINEAR INVARIANT CONDITIONAL ESTIMATION OF THE LOCATION AND SCALE PARAMETERS OF THE WEIBULL PROBABILITY DISTRIBUTION BY THE USE OF ORDER STATISTICS.
Master's thesis,
Robert W. Elkins. Dec 70, 558p Rept no. GRE/MATH/70-4
See also report AD-768 388.

Descriptors: *Sampling, *Weibull density functions, *Reliability, Failure, Approximation, Probability density functions, Tables(Data), Theses.
Identifiers: Parameter estimation, *Order statistics.

The thesis applies the principles of linear parameter estimation by the use of order statistics to the Weibull probability distribution. The shape parameter is assumed to be known. The nearly best approach is used and theory is developed to provide conditional estimates of both location and scale parameters which yield the minimum mean square deviation of the parameter among all nearly best linear estimators. Coefficients are tabled for shape parameters equal to .5(.5)2.0(1.0)4.0 and sample sizes equal to 1(1)40. Censoring from above is used with censor points in increments of one at a time in sample sizes of ten or less, two at a time in samples from 11 to 14, three at a time from 16 to 19, four at a time from 21 to 24 and five at a time in sample sizes of 26 and above. Sample sizes of 15(5)40 are censored in increments of one at a time. The results are verified using Monte Carlo techniques. (Author)

AD-776 765/0GA PC$19.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
BEST LINEAR INVARIANT ESTIMATION OF THE LOCATION AND SCALE PARAMETERS OF THE WEIBULL DISTRIBUTION.
Master's thesis,
John R. Niles. Dec 70, 329p Rept no. GRE/MATH/70-6
See also report AD-733 172.

Descriptors: *Sampling, *Weibull density functions, *Reliability, Estimates, Probability density functions, Tables(Data), Invariance, Theses.
Identifiers: *Order statistics, Parameter estimation.

A method for finding conditional linear estimators having a minimal mean square error among all linear estimators is presented. The method is used to find and table estimation coefficients for the three parameter Weibull distribution. Tables are presented for sample sizes 2 to 15, and for eleven values of the shape parameter: 0.5(0.25)2.0(0.5)4.0. Estimation coefficients are presented for both uncensored samples and samples single censored from above. A method for finding simultaneous estimators is also presented. (Author)

AD-776 766/8GA PC$18.75/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
CONDITIONAL NEARLY BEST LINEAR ESTIMATION OF THE LOCATION AND SCALE PARAMETERS OF THE CAUCHY DISTRIBUTION BY THE USE OF CENSORED ORDER STATISTICS.
Master thesis Mar-Dec 69,
Edward Charles Jonson. Dec 69, 315p Rept no. GRE/MATH/69-4

Descriptors: *Sampling, *Probability density functions, Estimates, Tables(Data), Theses.
Identifiers: *Order statistics, *Cauchy density functions, Parameter estimation, Lagrange multipliers.

Methods of parameter estimation are mentioned and the rationale for using NBLUE estimation is presented. Necessary general order statistic theory is developed and the Cauchy distribution is applied to this theory. Idiosyncracies of the Cauchy distribution are noted also. NBLUE estimation theory is developed (for the location and scale parameters) to enable computation of linear estimator coefficients. Then coefficients are tabled for sample sizes N = 6(1)40(5)50 with additional censoring from above and also symmetrically. Efficiencies of conditional and simultaneous NBLUE estimators relative to BLUE estimators are also tabled. (Author)

AD-776 769/2GA PC$26.75/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
CONDITIONAL NEARLY BEST LINEAR ESTIMATION OF THE LOCATION AND SCALE PARAMETERS OF THE FIRST EXTREME VALUE DISTRIBUTION.
Master's thesis,
William C. Widenhouse. Dec 70, 474p Rept no. GRE/MATH/70-7
See also report AD-743 617.

Descriptors: *Sampling, *Weibull density functions, Estimates, Probability density functions, Reliability, Tables(Data), Theses.
Identifiers: *Order statistics, Parameter estimation.

Coefficients for conditional nearly best linear estimation of the location and scale parameters of the first (Type I) extreme value distribution are developed by means of order statistics. Calculations are based on minimizing the mean squared error between the value of the estimator and the value of the actual parameter. Tabled coefficients for sample sizes from 2 to 40 may be used for complete samples, for samples single censored from above, or for samples symmetrically censored from both ends. Coefficients may be used for the distribution of largest or smallest values and the two-parameter Weibull distribution. (Author)

AD-776 770/0GA PC$35.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
YEARLY BEST LINEAR CONDITIONAL UNBIASED ESTIMATION OF THE LOCATION AND SCALE PARAMETERS OF THE GAMMA PROBABILITY DISTRIBUTION BY THE USE OF ORDER STATISTICS.
Master's thesis,
Robert L. Davis. Dec 70, 645p Rept no. GRE/MATH/70-2

Descriptors: *Sampling, *Probability density functions, Estimates, Analysis of variance, Reliability, Mathematical models, Theses.
Identifiers: *Order statistics, Parameter estimation, *Gamma function.

A table of coefficients for nearly best linear conditional unbiased estimation of the location and scale parameters of the gamma probability distribution is given. Shape parameter values of 0.5(0.5)4.0 are considered. The theory of order statistics and a general estimation procedure are used to obtain coefficients for complete ordered samples of sizes one to forty for shape parameter values of 0.5(0.5)4.0. The estimation coefficients are also given for samples censored from above. These coefficients can be used for simultaneous unbiased estimation of the location and scale parameters. (Author)

AD-776 787/4GA PC$4.00/MF$1.45
Rockwell International Corp Canoga Park Calif Rocketdyne Div
APPROXIMATELY OPTIMUM TESTS AND CONFIDENCE BOUNDS FOR RELIABILITY PARAMETERS.
Interim rept. 1 Jan-31 Dec 73,
N. R. Mann. 27 Feb 74, 11p Rept no. R-9464 AFOSR-TR-74-0340
Contract F44620-71-C-0029

Descriptors: *Sampling, *Distribution functions, Reliability, Statistical tests.
Identifiers: Chi square test.

The research concerned investigation of methods for statistical testing of linear models used in the analysis of materials and chemical compounds and the study of the use of the non-central chi-square distribution to obtain simple, easily implemented, approximations to percentiles of distributions which are used widely by investigators in reliability analysis. (Modified author abstract)

AD-776 799/9GA PC$3.25/MF$1.45
Technology Inc Dayton Ohio
A MAXIMAL DETERMINANT PROBLEM.
Final rept. 1 Jun-31 Aug 73,
Stanley E. Payne. Dec 73, 33p ARL-73-0195
Contract F33615-71-C-1463

Descriptors: *Matrices(Mathematics), *Determinants(Mathematics), Inequalities, Transformations(Mathematics), Theorems.

The problem investigated in the report is the determination of the maximum possible value of the determinant of a matrix obtained by multiplying the transpose of a given matrix A by the matrix A, where A is a matrix of plus or minus 1's with at least as many rows as columns. The solution is obtained for most cases. A reasonably self-contained exposition of the prerequisite results from the literature is included. (Author)

AD-776 830/2GA Reprint
Texas Univ Austin Electronics Research Center
INITIAL CONDITIONS OF N X N SYSTEMS WITH DISCONTINUOUS HIGHER ORDER INPUT SIGNALS,
Baxter F. Womack, John T. Love, and James J. Truchard. 16 Mar 73, 3p AFOSR-TR-74-0435
Contract F44620-71-C-0091
Availability: Pub. in IEEE Transactions on Automatic Control, vAC-18 n6 p671-672 Dec 73.

Descriptors: *Differential equations, *Control theory, Linear systems, Matrices(Mathematics), Transformations(Mathematics).

The initial conditions at time t = 0(+) of n X n systems with discontinuous higher order input signals applied at t = 0 are different from the initial conditions at t = 0(-). The note presents a neat, compact solution to this problem using two different techniques. (Author)

AD-776 844/3GA Not available NTIS
Defence Research Board Ottawa (Ontario)
DESCRIBING FUNCTIONS, CIRCLE CRITERIA AND MULTIPLE-LOOP FEEDBACK SYSTEMS,
N. Ramani, and D. P. Atherton. 6 Apr 73, 2p Rept no. DRB-Reprint-3914
Availability: Pub. in Proceedings of IEE, v120 n7 p813 Jul 73.

Descriptors: *Functions(Mathematics), *Matrices(Mathematics), Feedback, Control, Canada.
Identifiers: Gerschgorin circle theorem.

AD-776 851/8GA Reprint
Minnesota Univ Minneapolis Dept of Mathematics
CONTINUITY OF BESSEL POTENTIALS,
Norman G. Meyers. 10 Aug 71, 16p AFOSR-TR-74-0416
Grant AF-AFOSR-883-67
Availability: Pub. in Israel Jnl. of Mathematics, v11 n3 p271-283 1972.

Descriptors: *Potential theory, *Bessel functions, Vector spaces, Set theory, Measure theory, Theorems.

It is shown that certain capacities associated with potentials of functions in Lebeague classes are non-increasing under orthogonal projection of sets. This inequality is then used to discuss continuity of traces of potentials on subspaces of possibly low dimension. The case of principal interest is the Bessel potential. (Author)

AD-776 910/2GA PC$8.25/MF$1.45
Army Research Office Durham N C
PROCEEDINGS OF THE CONFERENCE ON THE DESIGN OF EXPERIMENTS IN ARMY RESEARCH DEVELOPMENT AND TESTING (18TH) HELD AT ABERDEEN PROVING GROUND, MARYLAND, ON 25-27 OCTOBER 1972. PART 1.
Oct 73, 397p Rept no. AROD-73-2-Pt-1
See also Part 2, AD-776 911.

Descriptors: *Meetings, *Experimental design, *Army research, Mathematical models, Estimates, Confidence limits, Least squares method, Flight testing, Rocket research, Time series analysis, Bayes theorem, Computations, Computer programs.
Identifiers: Block design, Maximum likelihood estimation.

A partial listing of the contents is: Exploratory date analysis as part of a larger whole; The statistics of directions; An investigation of wind frequency response on the M50 rocket; Problems in designing experiments with large numbers of variables; Orthogonal estimates in weighing designs; Computer construction of balanced incomplete block designs; On spurious correlations for partially related variates; The least squares analysis of data generated by a piece-wise general linear model; Experimental establishment of accuracy of range-to-function measurements for artillery projectiles; An improved method of estimating the critical velocity of a projectile in penetration ballistics.

AD-776 911/0GA PC$8.00/MF$1.45
Army Research Office Durham N C
PROCEEDINGS OF THE CONFERENCE ON THE DESIGN OF EXPERIMENTS IN ARMY RESEARCH DEVELOPMENT AND TESTING (18TH) HELD AT ABERDEEN PROVING GROUND, MARYLAND, ON 25-27 OCTOBER 1972. PART 2.
Oct 73, 367p Rept no. AROD-73-2-Pt-2
See also Part 1, AD-776 910.

Descriptors: *Meetings, *Experimental design, *Army research, Mathematical models, Estimates, Wind tunnels, Ballistics, Confidence limits, Computer applications.
Identifiers: Block design.

The report is a technical report resulting from the Eighteenth Conference on the Design of Experiments in Army Research, Development and Testing. It contains many of the papers presented at that meeting. These treat various Army statistical and design problems.

AD-776 925/0GA PC$4.00/MF$1.45
Army Medical Research Lab Fort Knox Ky
AN EMPIRICAL STUDY OF THE CHI SQUARE APPROXIMATION TO THE DISTRIBUTIONS OF THE CHI SQUARE AND LOG LIKELIHOOD-RATIO CRITERIA OF GOODNESS OF FIT IN SMALL SAMPLES (WITH TABLES).
Final rept.,
James N. Cronholm, and Katharine Fulkerson. 29 Oct 73, 82p Rept no. USAMRL-1064

Descriptors: *Sampling, *Distribution functions, *Statistical tests, Approximation, Estimates, Tables(Data).
Identifiers: Goodness of fit tests, Chi square test.

The objectives of the study are the following: To provide new information concerning the chi square approximation to the discrete sampling distributions of the Pearson chi squared and log likelihood-ratio criteria of goodness of fit; to assess the adequacy of both tests and their exact counterparts with respect to Type I errors under two null hypotheses for moderate sample sizes n = or < 15 and categories k = or < 15; to compare the powers of the classical tests for two null and two alternative hypotheses; and, to investigate the problem of small expected category frequencies and pooling.

AD-776 985/4GA PC$5.50/MF$1.45
Brown Univ Providence R I Div of Applied Mathematics

A DISCRETE SPECTRUM OF SOLUTIONS OF THE WAVE EQUATION WITH STRONG CUBIC NONLINEARITY.
Technical rept.,
Frederic E. Bisshopp. May 73, 49p Rept no. TR-18
Contracts Noar-562(42), N00014-67-A-0191-0017

Descriptors: *Wave equations, *Partial differential equations, *Nonlinear differential equations, *Relativity theory, Cauchy problem, Calculus of variations, Numerical integration.

The nonlinear wave equation, (phi sub tt) - delta phi + (phi sup 3) = 0, has many solutions that are periodic in time and localized in space, all with infinite energies. The search for spherically symmetric solutions that are well represented by the simple approximation, phi(r,t) about = A(r) sin omega t, leads to a discrete spectrum of solutions (phi sub N(r,t;omega)). These solutions are discussed in the report. (Modified author abstract)

COM-74-10639/4GA PC$7.50/MF$1.45
National Bureau of Standards, Washington, D.C. Applied Mathematics Div.
TABLE OF HYPERBOLIC SINES AND COSINES X = 2 TO X = 10.
Applied mathematics series,
I. Stegun. 15 Nov 55, 87p NBS-AMS-45

Descriptors: *Hyperbolic functions, *Mathematical tables.
Identifiers: *Hyperbolic sines, *Hyperbolic cosines.

The paper contains values of sinh x and cosh x for x = 2 to x = 10 at intervals of 0.001 to nine significant figures.

COM-74-50114/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CONVERGENCE AND ABSTRACT SPACES IN FUNCTIONAL ANALYSIS.
Final rept.,
Edward T. Ordman. 1969, 30p
Pub. in Jnl. of Undergraduate Math., v1 n2 p79-96 Sep 69, and v2, n1 p25-36 Mar 70.

Descriptors: *Functional analysis, Topology, Vector spaces.

The paper is an expository survey of the theory of limit spaces, discussing and contrasting approaches by way of nets and filters and considering a number of the extent ways of axiomatizing such a structure. Applications are given to a number of common notions of convergence of functions and to the topology of function spaces linear topological spaces.

COM-74-50244/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SOME RVELOPMENTS IN LINEAR LEAST-SQUARES COMPUTATIONS.
Final rept.,
Roy H. Wampler. 1972, 17p
Pub. in Proceedings of Computer Science and Statistics Annual Symposium on the Interface (6th), Univ. of California, Berkeley, 16-17 Oct 72 17p.

Descriptors: *Least squares method, Computation, Computer programming.

The results of an evaluation of linear least-squares computer programs (Wampler (174, 175)) are briefly summarized. Subsequent work, including problems encountered, to provide a more accurate least-squares routine for the OMNITAB II program is discussed. In this connection, the comparative results of running a number of ill-conditioned problems on OMNITAB II and two other reliable programs are presented. A bibliography of the recent literature on least-squares analysis has been prepared with special emphasis on the computational aspects of obtaining least-squares solutions.

COM-74-50249/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
NUMERICAL EVALUATION OF MULTIPLE INTEGRALS.
Final rept.,
Seymour Haber. 1970, 46p
Pub. in SIAM (Society for Industrial and Applied Mathematics, v12 n4 p481-526 Oct 70.

Descriptors: *Integral equations, *Numerical analysis, *Numerical integration, Monte Carlo method, Number theory, Approximation.

The paper is an expository survey of the main methods that have been developed for numerical evaluation of multiple integrals. Among the approaches discussed are: the Monte Carlo method and its generalizations; number-theoretical methods, based essentially on the ideas of Diophantine approximation and equidistribution modulo 1: the functional analysis approach, in which the quadrature error is regarded as a linear functional and one attempts to minimize its norm; and the classical approach of designing formulas to be exact for polynomials of high degree while using as few values of the integrand as possible. Mose research in this field is quite recent.

COM-74-50257/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
GERSGORIN SETS AND THE FIELD OF VALUES.
Final rept.,
Charles R. Johnson. 1974, 4p
Pub. in Jnl. of Mathematical Analysis and Applications, v45 n2 p416-419 Feb 74.

Descriptors: *Matrices(Mathematics), Set theory.
Identifiers: Gersgorin circle theorem.

Two links are drawn between two well-known inclusion sets for the characteristic roots of a complex matrix: the field of values and the Gersgorin circles. An application is made to the theory of D-stable matrices.

COM-74-50259/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
AN EXPLICIT ISOMORPHISM WITH APPLICATIONS TO INEQUALITIES FOR MATRIX FUNCTIONS.
Final rept.,
R. Merris, and M. Newman. 1973, 7p
Pub. in Jnl. of Algebra, v25 n3 p468-474 Jun 73.

Descriptors: *Isomorphisms, *Matrices(Mathematics), *Inequalities.

Inequalities for matrix functions are derived in a uniform way from an explicit isomorphism.

COM-74-50263/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SYMMETRIC COMPLETIONS AND PRODUCTS OF SYMMETRIC MATRICES,
Morris Newman. 1973, 10p
Pub. in Transactions of the American Mathematical Society, v186 p191-201 Dec 73.

Descriptors: *Matrices(Mathematics), *Ring theory.

It is shown in the paper that any vector of n relatively prime coordinates from a principal ideal ring R may be completed to a symmetric matrix of SL(n, R), provided that n > or = 4. The result is also true for n = 3 if R is the ring of integers Z. This implies for example that if F is a field, any matrix of SL(n, F) is the product of a fixed number of symmetric matrices of SL(n, F) except when n = 2, F = GF(3), which is a genuine exception.

LA-5463-MS PC$5.45/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).

TABLES OF SOLUTIONS OF THE DIOPHANTINE EQUATION X EXP 3 + Y EXP 3 = Z EXP 3 - D.
V. L. Gardiner, R. B. Lazarus, and P. R. Stein.
Nov 73, 67p
Contract W-7405-eng-36

Descriptors: (*Equations, *Analytical solution), Tables.

For abstract, see NSA 29 07, number 17952.

N74-16977/2GA PC$15.00/MF$1.45
Colorado Univ., Boulder. Dept. of Electrical Engineering.
SYNTHESIS OF OSCILLATING ADAPTIVE FEEDBACK SYSTEMS.
J. W. Smay. 1 Jun 73, 239p NASA-CR-136940
Contracts NGR-06-003-083, NSF GK-33485

Descriptors: *Adaptive control, *Feedback control, *Systems engineering, Nonlinear systems, Oscillations, Simulation.

For abstract, see STAR 1208

N74-17314/7GA PC$7.25/MF$1.45
Colorado Univ., Boulder. Dept. of Electrical Engineering.
DESIGN PROCEDURE FOR SATISFYING TIME DOMAIN BOUNDS FOR NONMINIMUM-PHASE SYSTEMS.
W. D. Ostheimer. 1 Dec 72, 82p NASA-CR-136942
Contracts NGR-06-003-083, NSF GK-33485

Descriptors: *Feedback control, *Half planes, Computer programs, Computerized design, Specifications, Time response.

For abstract, see STAR 1208

N74-17315/4GA PC$7.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SOLUTION OF AN EIGENVALUE PROBLEM FOR THE LAPLACE OPERATOR ON A SPHERICAL SURFACE.
M.S. Thesis - Maryland Univ.
H. Walden. Feb 74, 80p NASA-TM-X-70591, X-582-74-41

Descriptors: *Eigenvalues, *Laplace transformation, *Spheres, Elliptic differential equations, Finite difference theory, Iterative solution.

For abstract, see STAR 1208

N74-17316/2GA PC$6.25/MF$1.45
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
BASIC ELEMENTS OF POWER SPECTRAL ANALYSIS.
D. D. Sentman. Jan 74, 62p NASA-CR-136931, U-OF-IOWA-74-5
Contracts NGL-16-001-002, N00014-68-A-0196-0003
Misc-Supersedes U-of-Iowa-73-24.

Descriptors: *Power spectra, *Spectrum analysis, Fortran, Frequency scanning, Statistical analysis, White noise.

For abstract, see STAR 1208

N74-17318/8GA PC$4.25/MF$1.45
Institut de Recherche d'Informatique et d'Automatisme, Roquencourt (France).
IDENTIFICATION, SIMULATION, AND RANDOM SIGNAL PROCESSING BASED ON GAUSSIAN MARKOVIAN REPRESENTATIONS IDENTIFICATION, SIMULATION ET TRAITEMENT DE SIGNAUX ALEATOIRES A PARTIR DE REPRESENTATIONS GAUSSIENNES MARKOVIENNES.
M. Clerget, P. Faurre, F. Germain, and F. Levieux. 1973, 21p

Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973. Language in French.

Descriptors: *Algorithms, *Markov processes, *Normal density functions, *Random signals, *Signal processing, Linear systems, Simulation.

For abstract, see STAR 1208

N74-17320/4GA PC$8.00/MF$1.45
Technische Hogeschool, Delft (Netherlands). Dept. of Aeronautical Engineering.
APPLICATION OF THE SOMMERFELD METHOD TO THE STRIP PROBLEM DE METHODE VAN SOMMERFELD EN HET STRIP-PROBLEEM.
G. Schouten. Oct 73, 96p VTH-177
In Dutch; English Summary.

Descriptors: *Method of characteristics, *Partial differential equations, *Sommerfeld approximation, Bessel functions, Eigenvectors, Helmholtz equations, Laplace equation, Polar coordinates.

For abstract, see STAR 1208

ORNL-TM-4404 PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
USER'S MANUAL FOR MODSOV, A TERMINAL OPERATED PROGRAM SOLVING THE LINEAR MATRIX EQUATION X = AX + K.
F. H. Clark, R. S. Booth, and H. A. Vanderploeg. Jan 74, 41p
Contract W-7405-eng-26

Descriptors: (*Differential equations, *Analytical solution), (*Computer codes, *M codes), (*Ecology, *Mathematical models).

For abstract, see NSA 29 07, number 17953.

ORO-3992-159 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
EXISTENCE OF THE STEADY STATE IN THE STOCHASTIC VOLTERRA MODEL.
V. T. N. Reddy. 4p CPT-203
Contract AT(40-1)-3992

Descriptors: (*Stochastic processes, *Volterra integral equations), Distribution, Probability.

For abstract, see NSA 29 07, number 17969.

PB-230 442/6GA PC$4.00/MF$1.45
Bureau of Labor Statistics, Washington, D.C.
NORMALIZED MODIFIED GRAM-SCHMIDT ALGORITHM FOR THE SOLUTION OF LINEAR LEAST SQUARES EQUATIONS,
James W. Longley. Jul 73, 82p* BLS-DF-73-0040-PC, Working Paper-17
See also PB-230 443.

Descriptors: *Least squares method, *Regression analysis, *Computer programming, Algorithms, Matrices(Mathematics), Computation.

The paper presents a library package consisting of six programs for linear squares regression analysis.

PB-230 917/7GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
ON A PROBLEM OF KATONA ON MINIMAL SEPARATING SYSTEMS,
Andrew Chi-Chih Yao. Mar 74, 15p UIUCDCS-R-74-629
Grant NSF-GJ-41538

Descriptors: *Set theory, Recursive functions, Inequalities, Theorems.

Let S be an n-element set. In the paper, the author determines the smallest number f(n) which there exists a family of subsets of S ((A sub 1), (A sub 2), ..., (A sub(f sub n))) with the following property: Given any two elements x, y an element of S (x not=y), there exist k, l such that (A sub K) intersects (A sub l) not=O, and x an element of (A sub K), y an element of A. In particular it is shown that f(n) = 3 log (base 3) n when n is a power of 3. (Author)

RFP-Trans-142 PC$5.75/MF$1.45
Foersvarets Forskningsanstalt, Stockholm (Sweden).
DIGITAL-FREQUENCY METHOD.
A. Nyblom, and E. Ulen. 74p
Translation of FOA--2-A-2432-234.

Descriptors: (*Missiles, *Control systems), Analog systems, Digital systems.

For abstract, see NSA 29 07, number 17954.

SLA-73-1060 PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SOLVING ORDINARY DIFFERENTIAL EQUATIONS WITH ODE, STEP, AND INTRP.
L. F. Shampine, and M. K. Gordon. Jan 74, 26p
Contract AT(29-1)-789

Descriptors: (*Differential equations, *Analytical solution), Computer codes, I codes, O codes, S codes.

For abstract, see NSA 29 07, number 17956.

SU-326-P-30-29 PC$4.50/MF$1.45
Stanford Univ., Calif. (Usa). Dept. Of Computer Science.
SOLUTION OF SPARSE INDEFINITE SYSTEMS OF EQUATIONS AND LEAST SQUARES PROBLEMS.
C. C. Paige, and M. A. Saunders. Nov 73, 49p STAN-CS-73-399
Contract AT(04-3)-326

Descriptors: (*Equations, *Analytical solution), Algorithms, Computer codes, Fortran, Least square fit, Matrices.

For abstract, see NSA 29 07, number 17958.

UCRL-13586 PC$8.00/MF$1.45
Colorado State Univ., Fort Collins (Usa). Dept. Of Electrical Engineering.
APPLICATION OF LINEAR TRANSFORMS AND ESTIMATION THEORY TO THE ANALYSIS OF CHEMICAL DATA. FINAL REPORT.
T. A. Brubaker. 15 Aug 73, 119p
Contract Subcontract 8032409

Descriptors: (*Data processing, *Process control), (*Chemistry, Data processing), Control systems, Electric filters.

For abstract, see NSA 29 07, number 17959.

12B. Operations Research

AD-776 339/4GA PC$4.50/MF$1.45
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
ALGORITHM FOR COMPUTING THE PARAMETERIZED SOLUTION OF A FAMILY OF MINIMAX PROBLEMS.
Technical rept.,
R. Muralidharan. Mar 74, 111p Rept no. TR-630
Contract N00014-67-A-0298-0006, Grant NSF-GK-31511

Descriptors: Minimax technique, Nonlinear programming, Convex sets, Steepest descent method, Theorems, Algorithms, Computer programs, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The report documents the research done to develop a new algorithm for computing the parameterized solution to a family of minmax problems.

AD-776 406/1GA PC$3.25/MF$1.45
George Washington Univ Washington D C Inst for Management Science and Engineering
AN ARC METHOD FOR NONLINEAR PROGRAMMING.
Technical rept.,
Garth P. McCormick. 15 Feb 74, 45p Rept no. Serial-T-295 AROD-11505.1-EL
Contract DAHC04-73-C-0009

Descriptors: *Nonlinear programming, Convergence, Permutations, Computations, Algorithms.

An algorithm using second derivatives for solving the optimization problem: minimize f(x) subject to (g subi) (x) > or = 0, i = 1,...,m where the (g sub i) are not necessarily linear is presented. The basic idea is to generate a sequence of feasible points with decreasing objective values by movement along piecewise, smooth, quadratic arcs. Cluster points of the sequence generated are shown to be second-order Kuhn-Tucker points. If the strict second order sufficiency conditions hold the rate of convergence is shown to be at least quadratic. (Author)

AD-776 466/5GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Mathematics
REVERSED GEOMETRIC PROGRAMS TREATED BY HARMONIC MEANS,
R. J. Duffin, and Elmor L. Peterson. 17 May 72, 22p Rept no. 71-19 AROD-9300.9-M
Grant DA-ARO-D-31-124-71-G17
Prepared in cooperation with Northwestern Univ.
Availability: Pub. in Indiana University Mathematics Jnl., v22 n6 p531-550 Dec 72.

Descriptors: *Mathematical programming, Approximation, Theorems.
Identifiers: *Geometric programming, Duality theory, Signomials.

The paper presents another approach to solving signomial programs (and hence lagebraic programs) by solving a sequence of approximating geometric programs, each of which can be solved by the techniques of prototype geometric programming. (Author)

AD-776 467/3GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Mathematics
GEOMETRIC PROGRAMMING WITH SIGNOMIALS,
R. J. Duffin, and E. L. Peterson. 1973, 33p AROD-9300.14-M
Grant DA-ARO-D-31-124-71-G17
Availability: Pub. in Jnl. of Optimization Theory and Applications, v11 n1 p3-35 Jan 73.

Descriptors: *Mathematical programming, Polynomials, Inequalities, Theorems.
Identifiers: *Geometric programming, Signomials, Duality theory.

The difference of two posynomials (namely, polynomials with arbitrary real exponents, but positive coefficients and positive independent variables) is termed a signomial. The paper discusses the use of signomials in geometric programming.

AD-776 471/5GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa
CONVEX ANALYSIS TREATED BY LINEAR PROGRAMMING,
R. J. Duffin. 26 May 72, 20p AROD-9300.13-M
Grant DA-ARO-D-31-124-71-G17
Availability: Pub. in Mathematical Programming, v4 p125-143 1973.

Descriptors: *Linear programming, *Convex sets, Vector spaces, Inequalities, Theorems.
Identifiers: Duality theory.

The theme of the paper is the application of linear analysis to simplify and extend convex analysis. The central problem treated is the standard convex program - minimize a convex function subject to inequality constraints on other convex functions. The present approach uses the support planes of the constraint region to transform the convex program into an equivalent linear program. Then the duality theory of infinite linear programming shows how to construct a new dual program of bilinear type. When this dual program is transformed back into the convex function formulation it concerns the minimax of an unconstrained Lagrange function. This result is somewhat similar to the Kuhn-Tucker theorem. However, no constraint qualifications are needed and yet perfect duality maintains between the primal and dual programs. (Author)

AD-776 515/9GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa
THE PROXIMITY OF (ALGEBRAIC) GEOMETRIC PROGRAMMING TO LINEAR PROGRAMMING.
R. J. Duffin, and Elmor L. Peterson. 18 May 72, 7p
AROD-9300.8-M
Grant DA-ARO-D-31-124-71-G17
Availability: Pub. in Mathematical Programming, v3 n2 p250-253 Oct 72.

Descriptors: *Linear programming, Computations.
Identifiers: *Geometric programming.

Geometric programming with (posy)monomials is known to be synonomous with linear programming. The note reduces algebraic programming to geometric programming with (posy)binomials. (Author)

AD-776 537/3GA PC$5.00/MF$1.45
Naval Postgraduate School Monterey Calif
PARAMETER ESTIMATION FOR A TWO-STATE SEMI-MARKOV MODEL OF A UNIVARIATE POINT PROCESS.
Master's thesis,
James Leroy Hornback. Mar 74, 40p

Descriptors: *Stochastic processes, Mathematical models, Random variables, Distribution functions, Partial differential equations, Computer programs, Memory devices, Theses.
Identifiers: Semi Markov processes, Parameter estimation, Maximum likelihood estimation.

Using the convenient second-order interval properties of a two-state semi-Markov model for a univariate point process, an automated technique for the estimation of the parameters in the model was researched and discussed. The power spectral density of intervals was estimated by the periodogram and a Kolmogorov-Smirnov test of fit was conducted. The asymptotic exponential distribution and independence of the periodogram points were used to calculate an approximate likelihood function. A system of equations was then formed to find the maximum likelihood estimates of the parameters. (Modified author abstract)

AD-776 609/8GA PC$5.75/MF$1.45
Stanford Univ Calif Dept of Engineering-Economic Systems
THE VALUE OF SEQUENTIAL INFORMATION.
Technical rept. 1 May-30 Dec 73,
Allen Clinton Miller, III. 31 Jan 74, 205p Rept no. EES-DA-73-1
Contract N00014-67-A-0112-0077, Grant NSF-GK-36491
Doctoral thesis. Report on Decision Analysis Program. See also AD-776 610.

Descriptors: *Decision theory, *Sequential analysis, *Information, Information theory, Risk, Costs, Bargaining, Weather forecasting, Theses.
Identifiers: Utility functions, Trees(Mathematics), Bidding.

In decision analysis, it is customary to think of the value of a piece of information as being a fixed amount against which the cost of learning the information should be compared. One should refuse to pay for the information if its cost exceeds its value. Otherwise one can expect to gain, in some statistical sense, by paying for the information. It is possible to extend this simple idea by incorporating the concepts of risk preference, utility functions, and imperfect information. However the basic concept remains the same. In principle a fixed maximum price can be determined that should be paid for a piece of information. One may then use this quantity, which is called the value of the information, to decide whether or not to buy the information.

AD-776 610/8GA PC$3.00/MF$1.45
Stanford Univ Calif Dept of Engineering-Economic Systems
THE VALUE OF SEQUENTIAL INFORMATION.
Technical rept. 1 May-30 Dec 73,
Allen Clinton Miller, III. 31 Jan 74, 24p Rept no. EES-DA-73-2
Contract N00014-67-A-0112-0077, Grant NSF-GK-36491
Report on Decision Analysis Program. Paper submitted to Management Science/Theory. See also AD-776 709.

Descriptors: *Decision theory, *Sequential analysis, *Information, Information theory, Costs, Uncertainty, Bargaining, Random variables, Probability density functions.
Identifiers: Prices, Bidding.

In decision analysis it is normal to consider the value of information to be a constant against which the cost of information is compared. However, when it is possible to buy information sequentially, the value of information is not a constant. Rather, it is a function of the prices of the various pieces of information, or observables. When one is faced with a decision and learn one observable, this information not only helps to make the original decision, but also helps to decide if more should be paid for the observables. For this reason, the first observable has a value above and beyond that which would be assigned if there were no possibility of obtaining additional information. To decide whether or not to buy one observable the prices of all the observables must be known. (Modified author abstract)

AD-776 843/5GA Reprint
California Univ Los Angeles Dept of Electrical Engineering
THE EVALUATION OF SUBOPTIMAL STRATEGIES USING QUASILINEARIZATION,
R. G. Graham, and C. T. Leondes. 1973, 90p
AFOSR-TR-74-0446
Grant AF-AFOSR-2166-72
Prepared in cooperation with New South Wales Inst. of Tech., Sydney (Australia). School of Mathematical and Computing Sciences.
Availability: Pub. in Control and Dynamic Systems, v10 p1-88 1973.

Descriptors: *Game theory, *Strategy, Differential equations, Computations, Calculus of variations.
Identifiers: Quasilinearization, Differential games, Pursuit evasion games, Multipoint boundary value problems.

In engineering practice the need for actual mechanization of a strategy nearly always results in one which is not mathematically optimal. The engineer/designer is usually forced to accept a suboptimal strategy. The structure of the paper involves three basic parts. In the first part, a variational approach is used to develop the necessary condition for optimality. In the second part, the quasilinearization method is extended to handle the general discontinuous, multiple subarc multipoint boundary value problem resulting from the necessary conditions. Finally, in the third part the quasilinearization technique is used to evaluate a specific suboptimal strategy for a ground to air interceptor. (Author)

AD-776 847/6GA Reprint
Massachusetts Inst of Tech Cambridge Electronic Systems Lab
A DESCENT NUMERICAL METHOD FOR OPTIMIZATION PROBLEMS WITH NONDIFFERENTIABLE COST FUNCTIONALS,
Dimitri P. Bertsekas, and Sanjoy K. Mitter. 12 Nov 72, 18p AFOSR-TR-74-0440
Grant AF-AFOSR-1941-70
Prepared in cooperation with Stanford Univ., Calif. Dept. of Engineering-Economic Systems, NSF Grant NSF-GR-29237. Revision of report dated 27 Mar 72.
Availability: Pub. in SIAM Jnl. of Control, v11 n4 p637-652 Nov 73.

Descriptors: *Nonlinear programming, *Convex sets, *Minimax technique, Control theory, Algorithms, Optimization.

In the paper the authors consider the numerical solution of convex optimization problems with nondifferentiable cost functionals. The authors propose a new algorithm, the epsilon-subradient method, a large step, double iterative algorithm which converges rapidly under very general assumptions. The application of the algorithm in some problems of nonlinear programming and optimal control is discussed. It is shown that the epsilon-subgradient method contains as a special case a minimax algorithm due to Pshenichnyi. (Author)

N74-17317/0GA PC$4.00/MF$1.45
Sheffield Univ. (England). Dept. of Probability and Statistics.
LIMITING DIFFUSIONS FOR THE CONDITIONED M/G/1.
D. P. Kennedy. Feb 73, 13p REPT-126/DPK-7

Descriptors: *Limits (Mathematics), *Queueing theory, Diffusion, Probability theory, Stochastic processes.

For abstract, see STAR 1208

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

N74-17639/7GA PC$9.50/MF$1.45
General Applied Science Labs., Inc., Westbury, N.Y.
ENGINEERING ANALYSES AND DESIGN CALCULATIONS OF NASA, LANGLEY RESEARCH CENTER HYDROGEN-AIR-VITIATED HEATER WITH OXYGEN REPLENISHMENT.
1973, 131p NASA-CR-132381, TM-173
Contract NAS1-8669

Descriptors: *Combustion chambers, *Gas heating, Cooling systems, Copper alloys, Linings, Performance prediction, Stress analysis.

For abstract, see STAR 1208

PATENT-3 287 592 Not available NTIS
Department of the Interior, Washington, D.C.

COAL BURNING WATER TUBE STEAM GENERATOR CONSTRUCTION EMBODYING INTEGRAL PRIMARY COAL SLAGGING TYPE FURNACE AND SECONDARY FURNACE.
Patent,
John W. Bishop. Filed 28 May 64, patented 28 Jun 66, 9p PAT-APPL-370 990, DOCKET/OCR-930
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Water tube boilers, *Patents, Furnaces, Coal, Heat transfer.
Identifiers: PAT-CL-122-328.

The patent relates to a slagging type, water cooled primary furnace which is disposed entirely within the confines of a water cooled secondary furnace. The system permits radiant heat transfer, by means of indirect combustion gas contact, to take place over the entire internal primary furnace surface. The system thus provides for a longer path of primary gas and coal travel. It further renders possible a construction wherein such a primary coal burning slagging type furnace lies entirely within the confines of a completely unitized, packaged boiler. The latter, which can be prefactory assembled, also employs the entire external surface of said primary furnace for heat transfer from the secondary furnace.

SLA-73-1032 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
IMPROVED QUALITY GSC-4 SEALING GLASS.
R. J. Eagan, and J. E. Shelby. Nov 73, 14p
Contract AT(29-1)-789

Descriptors: (*Glass, Seals), (*Seals, *Performance), Melting, Purification, Quality control, Removal, Silicon oxides, Thermal expansion, Time dependence, Very high temperature, Viscosity, Water.

For abstract, see NSA 29 07, number 18013.

13B. Civil Engineering

AD-776 368/3GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF MATHEMATICAL MODELS FOR THE PHYSICAL FATE PREDICTION OF DREDGED MATERIAL.
Final rept.,
Billy H. Johnson. Mar 74, 76p* Rept no. AEWES-TR-D-74-1

Descriptors: *Soils, *Waste disposal, *Mass transfer, Mathematical models, Sediment transport, Reviews.
Identifiers: *Dredging, *Spoil, Path of pollutants, Ocean waste disposal.

A literature search of technical journals coupled with contacts with other research groups has revealed that very little mathematical modeling of the physical fate of dredged material disposed of in an aquatic environment has been undertaken. The most significant modeling effort that has been found is a mathematical model for prediction of dispersion and settling in barged ocean disposal of wastes developed by R. C. Y. Koh and Y. C. Chang. This model allows for disposal of dredged material by instantaneous bottom dump as well as pumping the material through a pipe under a moving barge. For estuarine and riverine environments, no models capable of tracing dredged material from its initial release into the water column until it is stored on the bottom have been found.

AD-777 024/1GA PC$5.50/MF$1.45
Scientific Associates Inc Santa Monica Calif
CONCEPT DEVELOPMENT OF A FREE VORTEX OIL RECOVERY SYSTEM.
Final rept. 1 May 72-1 Feb 73,
Eugene B. Nebeker, and Sergio E. Rodriguez. 1 May 73, 195p* USCG-D-57-74
Contract DOT-CG-22878-A

Descriptors: *Water pollution, Vortices, Oceans, Oils.
Identifiers: *Oil pollution removal, Oil spills, Skimmers.

Objectives of the program were to develop the basic concept and test oil recovery performance with an experimental model of near prototype dimensions. Testing demonstrated the applicability of Free Vortex skimming in the operating conditions of specific interest to the Coast Guard: namely, oil films 1-inch thick and less, operation while stationary and in currents up to 0.75 knots, and severe Sea State 4 waves. However, the utility of the concept is not limited to this particular operating range but includes many other conditions and operating modes. Efficiency (oil volume/total volume recovered) varied between 10 and 46% over the range of the four oil film thicknesses tested, 1/16, 1/4, 1/2, and 1-inch. Recovery rate of 110 gpm was achieved. This rate was achieved because of pump size. Higher rates are possible depending on transfer pump size chosen. Recovery efficiencies did not appear to change with higher recovery rate. (Modified author abstract)

AD-777 037/3GA PC$3.25/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
EXPERIMENTAL DEVELOPMENT OF POTABLE WATER SUPPLY FOR NEW SOUTH POLE STATION.
Technical note,
John S. Williams. Feb 74, 30p Rept no. NCEL-TN-1328

Descriptors: *Drinking water, *Antarctic regions, Snow, Drilling, Melting, Boilers, Hoses, Pumps, Water supplies, Polar regions, Greenland.
Identifiers: *Rodriguez wells, *Potable water.

Background information about the water supply in polar regions and the development of the Rodriguez Well in Greenland are presented. The design concept of using waste heat from the diesel generators, procurement and fabrication of equipment, and the installation and operation of an experimental well at Old South Pole Station are described in detail. Problems encountered during the experiment were not serious, and the recommended changes are listed as part of the overall recommendation to construct a Rodriguez Well for the water supply at the New South Pole Station. (Author)

AD-777 046/4GA PC$3.75/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
TRENCHING ON SHORE AND IN THE OCEAN IN ARCTIC REGIONS: STATE-OF-THE-ART SURVEY.
Technical note,
M. C. Hironaka. Mar 74, 54p* Rept no. NCEL-TN-1335

Descriptors: *Trenching, *Arctic regions, *State of the art, Underground, Underwater, Cables, Pipelines.

The objective of this study was to identify present techniques, procedures, and equipment that could be used for developing trenches for cables and pipelines in sea-to-shore installations in arctic regions. In pursuing this objective, a literature search was performed. The results of that effort are reported herein. Factors influencing polar trenching operations include: (1) materials to be trenched, (2) properties of permafrost and frozen ground, (3) depth to permafrost or frozen ground, (4) seafloor ice scoring, (5) oceanographic factors, and (6) seasonal effects. For sea-to-shore cable and pipeline installations, present trenching methods have some limitations; thus, it is recommended that a trenching device capable of operating on land, through the surf zone, and in deep water be developed to trench through all material including rock and which uses high pressure water jetting, normal water jetting, and suction dredging techniques. (Modified author abstract)

COM-74-10584-02/GA
(Order as COM-74-10584)
Rhode Island Univ., Kingston. Master of Marine Affairs Program.
COMPREHENSIVE LAND USE PLANNING - ITS DEVELOPMENT AND POTENTIAL IMPACT ON COASTAL ZONE MANAGEMENT,
R. A. Siuta. 1973, 25p NOAA-74020701-2
Included in Marine Affairs Jnl., n1 p9-32, Dec 73.

Descriptors: *Land use, *Regional planning, *Rhode Island, National government, State government, Legislation, Local government.
Identifiers: *Coastal zone management, Sea Grant program.

The federal government is in the process of shifting its interest from specific land use controls to a more comprehensive land use system. This system, similarly described by the Jackson, Administration and Muskie Land Use Bills, focuses land use responsibility upon the state government but requires local participation in the planning and implementing stages. The State of Rhode Island is following a trend similar to that of the national government.

COM-74-10584-04/GA
(Order as COM-74-10584)
Naval War Coll., Newport, R. I.
SOLID WASTE DISPOSAL AND OCEAN DUMPING,
J. W. Sellers. 1973, 27p NOAA-74020701-4
Included in Marine Affairs Jnl., n1 p52-77, Dec 73.

Descriptors: *Solid waste disposal, *Oceans, Pollution, Reviews.
Identifiers: *Ocean waste disposal, Sea Grant program.

This study of solid waste disposal relates directly to the problem of how best to use the marine environment constructively as part of the solution to the disposal problem, if this is necessary or required. In order to determine the need for using the oceans for waste disposal, it is necessary to determine the utility of all disposal methods with their costs, both quantitative and qualitative. Therefore, the objective is to determine if the marine environment will be required for solid waste disposal in view of practicality, costs and benefits of other alternatives. Results may indicate the need for further analyses to determine the maximum acceptable extent of ocean dumping.

COM-74-10584-05/GA
(Order as COM-74-10584)
Woods Hole Oceanographic Institution, Mass.
COASTAL ZONE PLANNING: THE IMPACT OF REGIONAL EFFORTS IN NEW ENGLAND,
S. H. Anderson. 1973, 14p NOAA-74020701-5
Included in Marine Affairs Jnl., n1 p78-90, Dec 73.

Descriptors: *Coasts, *Regional planning, *Organizations, New England.
Identifiers: Coastal zone management, Sea Grant program.

Development of coastal zone planning in the New England states has benefited from regional efforts to induce information sharing and cooperative planning. Although no governmental structure exists on a regional level to effect management implementation, a number of regional organizations, both public and private, are capable of providing significant inputs to comprehensive coastal resource planning. Details on some of these organizations are followed by an analysis of the means by which a regional perspective may be further encouraged through citizen involvement. (Modified author abstract)

COM-74-10589/1GA PC$3.75/MF$1.45
Universities Marine Center, Ocean Springs, Miss.

THE DELINEATION OF AND FACTORS AFFECTING MISSISSIPPI COASTAL ESTUARIES AND TIDAL MARSHES.
Clyde E. Cook, Michael L. Bridge, Thomas J. Brooks, III, Gerald Langston, Jr., and N. B. Carl Laurent. Nov 71, 72p MSGP-71-002 NOAA-74021910

Descriptors: *Mississippi, *Coasts, *Land use, Management planning, Economic factors, Natural resources, Swamps, Estuaries, Pollution.
Identifiers: *Coastal zone management, Salt marshes, Sea Grant program.

The purpose of this study was to determine the need and feasibility of land use and environmental controls to protect Mississippi's coastal zone environment, with particular attention and emphasis given to methods of protecting the aesthetic values, quality of living, and economic welfare of the coastal zone. Population increases and poorly planned industrial expansion, have begun to handicap the economies they were supposed to enhance; the law of diminishing returns is actively present. Analysis of how the coastal zone's aesthetics, living quality, and economy is being handicapped by these elements is the major objective of this study.

COM-74-10696/4GA PC$5.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
OCEAN UTILIZATION AND COASTAL ZONE DEVELOPMENT.
Completion rept. Jul 71-Jun 73,
Nancy Poling. 30 Jun 73, 41p MITSG-74-5 NOAA-74030601
Contract NOAA-2-35150
Index no. 74-005-Zarj.

Descriptors: *Oceanographic data, *Coastal zone management, *Marine resources, Education, Transportation, Ports, Estuaries, Squids, Food processing, Seafood, Commerce, Canals, Ocean environments, Massachusetts Bay, Crude oil, Superports, Ocean engineering, New England, Machias Bay.
Identifiers: Sea Grant program.

The Coherent Area Project for 1971-1972 involved eighteen projects, both interdisciplinary and highly specialized, and an expanding program of education and training in ocean utilization and coastal zone management. Brief summaries are given on research activities in the following: ocean transportation, future of Atlantic ports, estuary modeling, utilization of squid for processed food products, ocean commerce and the future of the oceanic canal, sea environment in Massachusetts Bay and adjacent waters, underwater welding, coastal zone and offshore resources management, offshore petroleum and New England, environmental impact of a superport in the Machias Bay area, interdisciplinary systems design subject, ocean engineering student summer laboratory, public education and training short courses, marine resources information center, symposia on Sea Grant projects and marine resource related topics; Sea Grant related reports and information and support to other institutions.

COM-74-10717/8GA PC$4.50/MF$1.45
Rhode Island Univ., Kingston. Sea Grant Program.
A REPORT ON THE UNIVERSITY OF RHODE ISLAND SEA GRANT PROGRAM FOR JULY 1972 TO JUNE 1973,
Niels Rorholm. 1974, 26p NOAA-74031109

Descriptors: *Marine resources, *Marine technology, *Coastal zone planning, Rhode Island, Grants, Coastal zone management, Commercial fishing, Fisheries, Aquaculture, Marinas, Pollution, Beaches, Shellfish, Education.
Identifiers: *Sea Grant program, Barrier beaches.

The goal of the University of Rhode Island Sea Grant program is to promote wise use of the coastal environment. During 1972-73, carrying out the Sea Grant objective has meant helping people in their ocean-oriented occupations- helping fishermen at Point Judith, RI, boost their herring catch six-fold over that of two years ago; providing experimental data necessary for construction of the first salmon aquaculture facility of its kind in New England; carrying out research at the request of the boating industry to determine if small boat marinas present a serious pollution problem, and providing a diagnostic service for fish hatcheries and commercial fish grower in and out of the state.

COM-74-10721/0GA PC$4.50/MF$1.45
University of Southern California, Los Angeles. Sea Grant Program.
COMMUNITY DECISION-MAKING AND ENERGY EXPLORATION: THE PACIFIC PALISADES CONFLICT,
Michael J. Briggs, and Mitchell L. Moss. Dec 73, 108p* USC-SG-7-73 NOAA-74030412
Grant NOAA-043-158-45
Report on Student Papers in Marine Resource Management.

Descriptors: *Energy, *Exploration, *Local government, Petroleum industry, Natural gas, Fuels, Decision making, Environments, Landslides, Litigation, Offshore drilling, California, Drilling.
Identifiers: Sea Grant program, Pacific Palisades conflict, Los Angeles(California).

The 'energy crisis' is beginning to affect us all. One way to ease this fuel shortage is to discover more new domestic supplies of oil and gas. Since most new sources will probably be in populated areas, it will be necessary to carefully evaluate the environmental and social costs versus the demand. It is at the local community level where the environmental costs of energy exploration will be most acutely felt; and thus, where opposition to proposals for energy exploration and development, is likely to be most vigorously articulated. In this paper the authors examine the capacity of local governmental units to make decisions dealing with energy exploration. The conflict which emerged from the proposal to undertake oil drilling and exploration in the Pacific Palisades section of Los Angeles provides an ideal opportunity to examine community decision-making in local energy exploration. The various environmental, economic, geological, social, aesthetic, political, and legal aspects of this conflict are examined in detail and suggestions are offered which, hopefully, will increase the effectiveness of the local governmental agency in the future. (Author)

COM-74-90025/9GA PC-Free/MF$1.45
Economic Development Administration, Washington, D.C.
EDA - BUILDING COMMUNITIES WITH JOBS.
Mar 74, 8p

Descriptors: *Urban planning, *Employment, *Community development.

The goal of the EDA program is to help make depressed communities better places in which to live, to work, and to invest. Topics are briefly discussed under the following headings: EDA - building communities with jobs; breaking the web of circumstance; no easy cure; new tools for the job; EDA programs; EDA assistance is available to; and the rebound aids the nation.

COO-2158-10 PC$4.00/MF$1.45
Wisconsin Univ., Milwaukee (Usa). Center for Great Lakes Studies.
INVESTIGATION OF THE INFLUENCE OF THERMAL DISCHARGE FROM A LARGE ELECTRIC POWER STATION ON THE TEMPERATURE AND NEAR-SHORE CIRCULATION OF LAKE MICHIGAN. QUARTERLY PROGRESS REPORT, 1 OCTOBER 1973--31 DECEMBER 1973.
C. H. Mortimer, and G. K. Sato. 1973, 4p
Contract AT(11-1)-2158

Descriptors: (*Fossil-fuel power plants, *Thermal effluents), (*Lake michigan, *Thermal pollution), Computers, Data processing, Diffusion, Thermal diffusion, Time dependence.

For abstract, see NSA 29 07, number 15666.

E74-10391 PC$4.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
APPLICATION OF ERTS-1 DATA TO THE PROTECTION AND MANAGEMENT OF NEW JERSEY'S COASTAL ENVIRONMENT.
Progress rept.,
Roland Yunghans, Edward B. Feinberg, Frank J. Wobber, Robert L. Mairs, and Robert J. Macomber. 19 Mar 74, 5p NASA-CR-137209
Contract NAS521765
Prepared in cooperation with New Jersey Dept. of Environmental Protection, Trenton.

Descriptors: Resources management, Coastal water, New Jersey, Coastal ecology, Environment protection, Earth resources program, Acids, Waste disposal, Erosion, Beaches.

The author has identified the following significant results. Rapid access to ERTS data was provided by NASA GSFC for the February 26, 1974 overpass of the New Jersey test site. Forty-seven hours following the overpass computer-compatible tapes were ready for processing at EarthSat. The finished product was ready just 60 hours following the overpass and delivered to the New Jersey Department of Environmental Protection. This operational demonstration has been sucessful in convincing NJDEP as to the worth of ERTS as an operational monitoring and enforcement tool of significant value to the State. An erosion/accretion severity index has been developed for the New Jersey shore case study area. Computerized analysis techniques have been used for monitoring offshore waste disposal dumping locations, drift vectors, and dispersion rates in the New York Bight area. A computer shade print of the area was used to identify intensity levels of acid waste. A Litton intensity slice print was made to provide graphic presentation of dispersion characteristics and the dump extent. Continued monitoring will lead to the recommendation and justification of permanent dumping sites which pose no threat to water quality in nearshore environments.

JPRS-61048 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY, NUMBER 7.
23 Jan 74, 41p
Trans. from various journals.

Descriptors: *Environments, *Pollution, *Abstracts, Translations, Czechoslovakia, Brazil, Columbia, Mexico, USSR, Industrial waste treatment, Noise, Radioactive wastes, Water pollution.

Included in the translated articles are: Antipollution measures in Czechoslovakia; water pollution in Brazil; natural resources in Columbia; and radioactive pollution, environmental hygiene, industrial wastes, non-polluting energy sources, and noise pollution in the USSR.

LBL-2444 PC$7.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
DISPERSION OF GASEOUS EMISSIONS FROM A GROUND-LEVEL LINE SOURCE.
K. D. Winges, E. A. II Grens, and T. Vermeulen. 19 Nov 73, 97p
Contract W-7405-eng-48

Descriptors: (*Earth atmosphere, Air pollution), (*Air pollution, *Mathematical models), (*Vehicles, Air pollution), Aerosols, Gases, Smokes, Velocity.

For abstract, see NSA 29 07, number 18021.

N74-16838/6GA PC$6.50/MF$1.45
General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
DEVELOPMENT OF A HOUSEHOLD WASTE TREATMENT SUBSYSTEM, VOLUME 1.
Final Report.
T. M. Gresko, and R. W. Murray. Oct 73, 68p
NASA-CR-132342-VOL-1
Contract NAS1-11770

Descriptors: *Human wastes, *Waste disposal, *Water reclamation, Catalysis, Condensers, Evaporators, Feasibility analysis, Incinerators, Solids.

For abstract, see STAR 1208

N74-16839/4GA PC$4.50/MF$1.45
General Electric Co., Philadelphia, Pa.
DOMESTIC WATER AND WASTE TREATMENT SUBSYSTEM, OPERATION AND MAINTENANCE MANUAL, VOLUME 2.
T. M. Gresko, and R. W. Murray. Oct 73, 28p
NASA-CR-132342-VOL-2
Contract NAS1-11770

Descriptors: *Human wastes, *Maintenance, *Waste disposal, *Water reclamation, Equipment specifications, Manuals, Operational problems.

For abstract, see STAR 1208

N74-17121/6GA PC$4.25/MF$1.45
Virginia Inst. of Marine Science, Gloucester Point.
ON THE USE OF DRIFT BOTTLE AND SEABED DRIFTER DATA IN COASTAL MANAGEMENT.
C. S. Welch, and J. J. Norcross. Aug 73, 23p
NASA-CR-136939, VIMS-CONTRIB-571
Contract NGL-47-022-005
Subm-Submitted for Publication.

Descriptors: *Coastal ecology, *Environment management, Atlantic ocean, Ocean currents, Oceanography.

For abstract, see STAR 1208

N74-17331/1GA PC$3.25/MF$1.45
Southampton Univ. (England).
ECONOMIC AND ECOLOGICAL APPROACHES TO THE OPTIMAL LEVEL OF POLLUTION.
D. W. Pearce. Feb 73, 24p PAPER-7302

Descriptors: *Ecology, *Economic factors, *Environment pollution, *Environment protection, Cost analysis, Earth resources, Waste disposal.

For abstract, see STAR 1208

N74-17333/7GA PC$6.50/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DIFFUSION FROM A LINE SOURCE.
R. E. Burns. 16 Nov 73, 66p NASA-TM-X-64804

Descriptors: *Air pollution, *Atmospheric diffusion, *Line spectra, Analytic geometry, Automobile engines, Exhaust gases, Meteorological parameters, Mixing length flow theory.

For abstract, see STAR 1208

PAT-APPL-449 327 PC$4.00/MF$1.45
Department of Transportation, Washington, D.C.
AN AIRBORNE LASER REMOTE SENSING SYSTEM FOR THE DETECTION AND IDENTIFICATION OF OIL SPILLS.
Patent Application,
John F. Fantasia, and Hector C. Ingrao. Filed 8 Mar 74, 17p DOT/Case-TSC-10059

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Water pollution, *Optical detection, *Remote sensing, *Patent applications, Fluorescence, Lasers, Detectors, Oil.
Identifiers: PAT-CL-250-301-458, *Oil spills.

The patent application describes a technique for the identification, from a remote location, of oil comprising a marine oil spill. The technique includes directing pulses of high energy artificial light onto the spill to cause the oil to fluoresce and the incremental scanning of the frequency spectrum of thus generated fluorescence energy; there being a distinct fluorescent spectral signature for each type of oil. The invention also includes the rejection of background radiation and the real time presentation of the fluorescence spectrum of the oil comprising a spill.

PB-227 146/8GA PC$3.25/MF$1.45
Environmental Protection Agency, Washington, D.C.
INTERNATIONAL ENVIRONMENTAL BIBLIOGRAPHIES. ENVIRONMENTAL LEGISLATION. NORTH AMERICA.
Mar 74, 42p

Descriptors: *Pollution, *Environments, *Legislation, *Regulations, Bibliographies, North America, Canada, United States, Mexico, Trinidad, Abstracts, Honduras, Guatemala, Dominican Republic, Cuba, Costa Rica.

This is an annotated bibliography of reports related to national environmental laws, pollution control regulations and experiences in implementing legislative authorities in North American countries.

PB-227 147/6GA PC$5.75/MF$1.45
Environmental Protection Agency, Washington, D.C.
INTERNATIONAL ENVIRONMENTAL BIBLIOGRAPHIES. ENVIRONMENTAL LEGISLATION. EUROPE.
Mar 74, 218p

Descriptors: *Pollution, *Environments, *Legislation, *Regulations, Bibliographies, Abstracts, Western Europe, Eastern Europe.

This report contains summaries of documents received by the US Environmental Protection Agency. The summaries are related to major federal environmental legislation in twenty-five European countries. These reports are received as a part of the overall bi-national international documents exchange program established between the U.S. Environmental Protection Agency and other countries having major environmental agencies. (Author)

PB-227 630/1GA PC$3.75/MF$1.45
Kentucky Univ., Lexington. Coll. of Engineering.
PROCEEDINGS. COMMUNICATIONS SEMINAR FOR THE BUILDING INDUSTRY CONSULTING SERVICE, JUNE 6-8, 1973.
Dec 73, 59p* UKY-TR71-73-CEED5
Prepared in cooperation with American Telephone and Telegraph, Bell Canada and General Telephone and Electronics. See also PB-217 114.

Descriptors: *Telecommunication, *Consulting services, *Construction industry, *Meetings, Buildings, Urban areas, Building codes, Closed circuit television, Fire safety, Communication cables.

The report comprises a collection of papers representing the expertise of noted professionals and consultants in the field of communications. A wide range of topics and discussions are presented including providing building industry consulting (BIC) service in small cities, a new look at interconnections, Poke-Thru and building codes, closed circuit television raceway design, the Houston Center - a twenty-year study, the Welfare Island study, flammability and safety, and case histories of BIC projects.

PB-228 049/3GA PC-GPO/MF$1.45-NTIS
CONSULTEC, Inc., Rockville, Md.
FABRIC BOOM CONCEPT FOR CONTAINMENT AND COLLECTION OF FLOATING OIL.
Philip E. Bonz. Sep 73, 67p W74-04044, EPA-670/2-73-069
Contract EPA-68-01-0139

Descriptors: *Water pollution, *Oil, *Booms(Equipment), Boundary layer separation, Fabrics, Feasibility.
Identifiers: Oil pollution control, *Oil spills, *Oil retention booms, *Oil water separators, Hydrophilicity.

The feasibility of applying the concept of oil-water separation by means of woven hydrophilic fabric to a floating oil containment boom was investigated through a series of model tests. A preliminary model boom configuration was developed and towed at speeds to 0.686 meters/sec (2.25 ft/sec) in both calm water and waves. Oil retention performance of this model was clearly superior to that of a conventional flat plate boom of comparable draft in the environment investigated. A larger model of similar configuration demonstrated no oil leakage when towed at 0.77 meter/sec (1.5 kt) in calm water. While further detailed analysis, engineering, and testing is required to fully examine this concept, it appears that a properly designed flexible boom which uses a hydrophilic skirt material offers significant potential both as a containment device for floating oil in high current situations and as a high-speed collecting device. (Author)

PB-229 574/9GA PC-GPO/MF$1.45-NTIS
Stanford Research Inst., Menlo Park, Calif. Operational Evaluation Dept.
AESTHETICS IN ENVIRONMENTAL PLANNING,
Martin J. Redding. Nov 73, 192p W74-04987, EPA-600/5-73-009
Grant EPA-R-802441
Paper copy available from GPO $2.05 as EP1.23:600/5-73.

Descriptors: *Urban planning, *Environments, *Esthetics, Methodology, Regional planning, Environmental surveys, Quality.

Three primary aspects of the aesthetic concept are discussed: aesthetics and the human senses, aesthetics as thinking about the arts, and aesthetics as the science of beauty. Additional factors underlying the concept of aesthetics include: nature as an underlying force; cultural, social and economic phenomena as determiners of aesthetic expression; and aesthetics of American city life. Aesthetics is also discussed in the context of the National Environmental Policy Act.

PB-229 638/2GA PC$6.00/MF$1.45
Purdue Univ., Lafayette, Ind. Water Resources Research Center.
NITROGEN UPTAKE EFFICIENCY BY FOUR PLANT SPECIES IN THE FIELD AND GROWTH CHAMBER.
Technical rept.,
J. H. Edwards, D. D. Warncke, S. A. Barber, and D. W. Nelson. Dec 73, 60p TR-40 W74-05404, OWRR-B-026-IND(3)
Contract DI-14-01-0001-3778

Descriptors: *Farm crops, *Nitrogen, *Absorption(Biology), Water pollution, Soil water, Corn plants, Grain sorghum plants, Wheat plants, Soybean plants, Tests.
Identifiers: Path of pollutants, Water pollution control, Zea mays, Sorghum bicolor, Sorghum vulgare, Triticum vulgare, Glycine max, Bromus inerimus.

Lakes and streams may receive nitrate from waters draining from farm fields, hence it is important to minimize the nitrate level of these drainage waters. The objective of this research, conducted in the field, greenhouse and growth chamber, was to determine the principles controlling the level of nitrate left in the soil after cropping since this water is subject to leaching and moving into drainage waters. Comparisons among corn (Zea mays) at 4 populations, grain sorghum (Sorghum bicolor), forage sorghum, sudax (Sorghum vulgare) and wheat (Triticum vulgare) in field experiments showed that sorghum and sudax removed the greatest amount of nitrogen and had less unaccounted for when a nitrogen balance was calculated. (Modified author abstract)

PB-229 727/3GA PC$6.00/MF$1.45
Little (Arthur D.), Inc., Cambridge, Mass.
CAN FEDERAL PROCUREMENT PRACTICES BE USED TO REDUCE SOLID WASTE.
Final rept.,
Jack Milgrom. Mar 74, 232p* EPA-670/5-74-003
Contract EPA-CPE-68-03

Descriptors: *Government procurement, *Solid waste disposal, Purchasing, Papers, Paperboards, Metals, Packaging, Economics, Criteria, National government, Screening(Selection), Glass, Tires, Rubber, Reclamation, Containers, Cans.
Identifiers: Waste recycling.

The research discusses the possibilities for revising Federal Government procurement specifications to provide incentives for reducing solid waste. The extent of Federal direct purchases relative to domestic use was a primary consideration in the selection criteria. Disposal problems and the technical feasibility of including recycled materials in procurement specifications were also considered. The oppurtunity areas selected for in-depth evaluation were paper and paperborad, metals, glass, and rubber. Alternative scenarios were developed to assess the impacts of changing specifications for linerboard. The report concludes that changing government specifications for paper products, especially those used in packaging, offered the best opportunity for solid waste reduction.

PB-229 771/1GA
Mag Tape $175.00;Foreign $219.00
National Environmental Research Center, Research Triangle Park, N.C. Meteorology Lab.
USERS NETWORK FOR APPLIED MODELING OF AIR POLLUTION (UNAMAP).
Rept. for 1 Mar 73-1 Mar 74.,
A. D. Busse, P. E. Ruff, and D. B. Turner. 1 Mar 74, 1 reel mag tape, UNAMAP-001
See also PB-213 091.
Specify tape recording mode desired: 7 track, 556 or 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: *Air pollution, *Urban areas, *Mathematical models, *Magnetic tapes, FORTRAN.
Identifiers: FORTRAN 4 programming language, IBM 360 computers.

The single reel of magnetic tape contains (9) files of data relevant to the UNAMAP air quality models. The first file contains brief descriptions of the models. The second through seventh contains source Fortran codes for the six UNAMAP models, APRAC, HIWAY, CDM, PTMAX, PTDIS, and PTMTP respectively. The eighth file is a test set of emission inventory and meteorological data for CDM; the ninth file contains similar data for APRAC. The remainder of the models are interactive where the data is supplied by the user upon prompting by the master program. Mnauals are being prepared for the models and will have spearate NTIS accession numbers. The Fortran IV source code is self-documenting with frequent comments. The source computer and operating system is an IBM 360-OS. The tape recording mode is 9 track, 800 bits per inch, EBCDIC code, odd parity. Physical records each contain 10 logical records in card image format (i.e. 80 byte logical records; 800 byte block size). The tape can be copied to 7 track form without loss of data. (Author)

PB-229 782/8GA PC$5.75/MF$1.45
Academy of Natural Sciences of Philadelphia, Pa.
THE DELAWARE ESTUARY SYSTEM, ENVIRONMENTAL IMPACTS AND SOCIO-ECONOMIC EFFECTS. UPPER ESTUARY POLLUTION AND TRANSFER RELATIONSHIPS.
Final rept.,
Harvey Baker. Sep 73, 55p NSF-RA/E-73-014
Grant NSF-GI-33369
Prepared in cooperation with Rutgers-The State Univ., New Brunswick, N.J., and Delaware Univ., Newark.
Paper copy also available from NTIS $23.00/set of 3 reports as PB-229 780-SET.

Descriptors: *Delaware River Estuary, *Water quality, Water pollution, Mathematical models, Predictions, Regulations, Research projects.

This is a situational report to outline the environmental problems and situations existing with water quality and transfer functions in the upper estuary in the Delaware Estuary, and any interim suggestions for remedial action that may be apparent. This inquiry is designed to give the researcher on water quality in the Delaware Estuary an idea of what data is available and where to obtain it. A final purpose of this study is to show that this heavily urbanized area will continue to grow during the next four decades and to assess the amount of that growth and its effect on the water quality in the Delaware Estuary.

PB-229 783/6GA PC$7.50/MF$1.45
Academy of Natural Sciences of Philadelphia, Pa.
THE DELAWARE ESTUARY SYSTEM, ENVIRONMENTAL IMPACTS AND SOCIO-ECONOMIC EFFECTS. ANNEX TO VOLUME I. MANAGEMENT AGENCY PROBLEMS IN THE DELAWARE ESTUARY.
Final rept.,
William V. McGuinness, Jr. Apr 73, 89p NSF-RA/E-73-015
Grant NSF-GI-33369
Prepared in cooperation with Rutgers-The State Univ., N.J., and Delaware Univ., Newark.
Paper copy also available from NITS $23.00/set of 3 reports as PB-229 780-SET.

Descriptors: *Delaware River Estuary, *Management planning, Regional planning, Surveys, Land use, Waste disposal, Swamps, Recreation, Fisheries, Erosion, Water supply.
Identifiers: Coastal zone management.

The purpose of this report is to identify and evaluate the priority of the most serious estuarine-related problems faced by the principal managers and users of the Delaware Estuary in the coming three to ten years. The report is intended primarily for the use of the co-directors of the Delaware RANN Project.

PB-229 816/4GA PC$5.75/MF$1.45
Resource Planning Inst., Cambridge, Mass.
RAW MATERIALS TRANSPORTATION COSTS AND THEIR INFLUENCE ON THE USE OF WASTEPAPER AND SCRAP IRON AND STEEL. VOLUME I. TECHNICAL DISCUSSION,
Final rept.,
John F. Foran, Anne T. Heenan, and R. Gary Schweikhardt. Apr 74, 207p* RI-73-1-Vol-1 EPA-670/2-74-024-a
Contract EPA-R-801678
See also Volume 1, PB-229 817.

Descriptors: *Raw materials, *Material handling, *Papers, *Iron, *Cargo transportation, Rain transportation, Water transportation, Trucks, Cost analysis, Material recovery, Waste papers, Metal scrap, Iron and steel industry, Paper industry, Cost comparison, Prices, Steels.
Identifiers: *Secondary materials industry.

The grant study evalutes the importance of transportation charges for virgin and competing secondary materials in the investment decisions of the steel and papermaking industries. Three major modes of transport are considered- rail, motor carrier, and inland water barge. Transportation charges are evaluated with respect to revenues generated for carriers. Comparisons of differences in charges are made on both a direct and a chemical-equivalent basis. The report provides substantial empirical data on transportation rates, volume of shipments, and origin and destination for the selected materials. (Modified author abstract)

PB-229 817/2GA PC$4.00/MF$1.45
Resource Planning Inst., Cambridge, Mass.
RAW MATERIALS TRANSPORTATION COSTS AND THEIR INFLUENCE ON THE USE OF WASTEPAPER AND SCRAP IRON AND STEEL. VOLUME II. APPENDICES.
Final rept.,
John F. Foran, Anne T. Heenan, and R. Gary Schweikhardt. Apr 74, 100p RI-73-1-Vol-2 EPA-670/2-74-024-b
Contract EPA-R-801678
See also Volume I, PB-229 816.

Descriptors: *Materials handling, *Raw materials, *Iron, *Papers, *Cargo transportation, Rail transportation, Water transportation, Trucks, Cost analysis, Materials recovery, Steels, Statistical data, Waste papers, Metal scrap, Iron and steel industry, Paper industry, Cost comparison.
Identifiers: Secondary materials industry.

The grant study evaluates the importance of transportation charges for virgin and competing secondary materials in the investment decisions of the steel and papermaking industries. Volume II contains the background material and the supporting statistical data. (Modified author abstract)

PB-229 836/2GA PC$17.50/MF$1.45
Regional Science Research Inst., Philadelphia, Pa.
EFFECTS OF URBANIZATION ON STREAM CHANNELS AND STREAM FLOW.
Completion rept.,
Thomas R. Hammer. Nov 73, 288p W74-05534, OWRR-C-2174(3406)(3)
Contract DI-14-31-0001-3406

Descriptors: *Urbanization, *Surface water runoff, *Channels(Waterways), Stream flow, Floods, Land use, Urban planning, Soil erosion.

This report describes a number of studies which were concerned with the hydrologic impacts of urbanization. The principal studies have dealt with stream-channel enlargement due to urban development. The primary strength of the studies reported here is the very detailed treatment of urban land uses. Due to the use of large samples of streams, it was possible to consider the individual effects associated with a wide variety of land-use variables, and thus to establish the relative importance of factors such as the size of impervious surfaces, the provision of storm sewerage, the location of impervious area within a watershed, the relative amounts of building area and pavement area, etc. The studies thus have yielded predictive formulas which consider very specifically the type of urban development present in a watershed.

PB-229 886/7GA PC$5.00/MF$1.45
Los Angeles City Dept. of Traffic, Calif. Bureau of Traffic Research.
THE IMPROVED EFFECTIVENESS OF TRAFFIC SIGNAL SYSTEMS PROJECT. CONVENTIONAL SIGNAL NETWORK TIMING STRATEGIES.
Final rept.,
D. S. Terry. Jan 73, 36p Staff-57.07

Descriptors: *Traffic signals, *Intersections, Travel time, Evaluation, Mathematical models, Computer simulation, Los Angeles(California).

Identifiers: TRANS(Traffic Network Simulation Models), Traffic network simulation models, Traffic signal effectiveness, Traffic signal timing, Progressive signals.

Five conventional signal timing strategies, critical intersection, simultaneous, average progression, favored arterial, and one-way couplets, were evaluated in a network of 70 intersections in the Wilshire-Vermont area of the city of Los Angeles. The evaluation process consisted of simulation of the prposed strategy by digital computer and comparison of the simulated results to the existing 'before' conditions. Strategies markedly worse than the before condition were discarded forthwith. The Favored Arterial strategy was installed in the field and data collected. Comparisons were made among the field and simulated results of the Favored Arterial and the existing strategies. (Modified author abstract)

PB-229 894/1GA PC$9.75/MF$1.45
Office of Water Resources Research, Washington, D.C. Water Resources Scientific Information Center.
A SELECTED ANNOTATED BIBLIOGRAPHY ON THE ANALYSIS OF WATER RESOURCE SYSTEMS. VOLUME 4,
Daniel P. Loucks. Dec 73, 493p* WRSIC-73-218 W74-05401
See also PB-218 934.

Descriptors: *Water resources, *Systems analysis, Bibliographies, Abstracts, Optimization, Simulation, Operations research, Management, Planning, Evaluation.

An annotated bibliography containing 323 abstracts is presented of selected publications issued in 1971 and 1972 pertaining to the application of systems analysis techniques for defining and evaluating alternative solutions to water resource problems. Both subject and author indexes are provided. Descriptors are listed with each abstract. The abstracted material emphasizes the application of optimization and simulation techniques for assisting in the planning and management of water resource systems. (Modified author abstract)

PB-229 903/0GA PC$4.50/MF$1.45
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
INFORMATION LEAD DISTANCE STUDIES ELECTRONIC ROUTE GUIDANCE SYSTEMS.
Final rept.
Oct 73, 125p FHWA-RD-73-94
Contract FH-11-7356

Descriptors: *Motor vehicle operators, *Performance tests, *Reaction time, Decision making, Man machine systems, Traffic engineering.
Identifiers: *Driving task analysis, Driver behavior research, Automobile handling, ERGS(Electronic Route Guidance Systems), Electronic route guidance systems.

The report describes a series of studies that were performed on the information lead distance (ILD) required by drivers in order to execute successfully certain highway turn maneuvers, such as lane changes and turns. Experiments were performed to collect empirical data to be used in ILD estimating procedures. Measures which were both sensitive and reliable in determining ILD's were identified and used to estimate ILD's for selected intersections. A model for estimating ILD's for any generic intersection based upon a trace concept was developed. A description of how the results from the driving experiments can be applied to highway and traffic engineering problems is part of the report.

PB-229 922/0GA PC$4.75/MF$1.45
Ohio State Univ., Columbus. Dept. of Civil Engineering.
FEASIBILITY STUDY AND PRELIMINARY DESIGN OF A SYSTEM FOR RAPID EVALUATION OF RATIONAL PAVEMENT DESIGNS.
Final rept.,
K. Majidzadeh, and M. Luther. Jun 73, 128p* RF-3347-FR FHWA-RD-73-92
Contract FH-11-7838

Descriptors: *Pavements, *Test facilities, Loads(Forces), Stresses, Highways, Roadbeds, Cost analysis, Environment simulation.
Identifiers: Vehicle road interface.

The feasibility of designing a test facility for rapid evaluation of rational analysis of pavement systems is presented. The geometrical and operational features of various existing facilities and their inherent advantages and limitations to verify rational pavement design theories are discussed. The concept of pavement modeling using similitude principals is reviewed and its application to the problem under investigation is presented. The effect of rolling friction on pavement system is studied by use of a prismatic finite element model which evaluates stresses and strains in a hypothetical pavement structure. Two test facilities have been recommended for use in verification of rational design theories. A sensitivity analysis of variables influencing pavement life has been carried out, and a design of experiment fulfilling the objective of this research investigation has been documented. The geometrical and operational features of the proposed facilites, preliminary drawings and cost estimate for the construction of the facility are presented.

PB-229 938/6GA PC$5.75/MF$1.45
Texas Transportation Inst., College Station.
AN ANALYSIS OF DYNAMIC DISPLACEMENTS MEASURED WITHIN PAVEMENT STRUCTURES.
Research rept.,
Frank H. Scrivner, and William M. Moore. Aug 73, 53p TTI-2-8-69-136-6F, RR-136-6F
See also PB-219 202.

Descriptors: *Flexible pavements, *Cyclic loads, *Highways, Deflection, Displacement, Modulus of elasticity, Poison ratio, Mathematical models.

A mathematical model was developed for representing the measured displacement vector fields in thirty test sections at the Research Annex at Texas A and M University. While the model predicted the displacements fairly well in each test section, it was obvious that improvements were required in the model before attempting its use in the design of flexible pavements. (Author)

PB-229 939/4GA PC$4.75/MF$1.45
Mississippi State Univ., State College.
RATIONALE FOR GOVERNMENT INTERVENTION IN THE HOUSING SECTOR OF RURAL AMERICA,
Chester M. Wells, Jr., and James E. Montgomery. 8 Jun 73, 33p HUD-PDR-137
Contract HUD-H-2112
Paper 15 on National Housing Policy Study Papers. Background Studies. Volume 2.

Descriptors: *Housing studies, *Federal policies, *Rural development areas, Subsidy programs, Housing market, Housing shortages, Building codes.
Identifiers: *Housing and urban development research.

The document reviews how improved rural housing is a requisite of the more functional distribution of population needed to accelerate urban and rural development. It appears that only the Federal Government has the capacity to provide housing subsidies, to improve the performance of the housing market and to assure the adequacy of housing - related activities -- transportation facilities, housing support systems, building codes, rural zoning. Federal Government efforts must be coordinated to minimize policy conflicts, to maximize meshing of program elements, to minimize conflicts in Federal guidelines and to maximize assistance to state and local housing improvement.

PB-229 948/5GA PC$12.75/MF$1.45
California State Div. of Highways, Sacramento. Bridge Dept.
LOAD DISTRIBUTION IN A COMPOSITE STEEL BOX GIRDER BRIDGE.
Research rept. Oct 70-Jun 73,
Raymond E. Davis, and Gary A. Castleton. Jun 73, 195p CA-HY-BD-4137-73-7

Descriptors: *Girder bridges, *Composite structures, Loads(Forces), Box beams, Bridge decks, Dynamic loads, Shear stress, Data processing, California.
Identifiers: *Box girders, Finite element analysis.

Field tests were performed to assess the behavior of a steel box girder bridge having a composite, concrete, roadway deck slab. The structure was instrumented at one midspan cross-section and a section near the support of Span 20, one of the simple approach spans, to permit studies of bending and shear strain distributions. Live load was applied with a simulated AASHO design truck and a double goose-neck, lowbed hauler ballasted to a gross load of 220,000 pounds. Theoretical analyses were performed with a finite element program called FINPLA. Live load membrane strains were accurately predicted by the program, but fiber strains, especially in the transverse direction, were greatly influenced by plate warpage and initial, local, dead load deflections. (Modified author abstract)

PB-229 981/6GA PC$4.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
BUILDING CODES AND MANUFACTURED HOUSING,
David Falk. 28 Jun 73, 102p* HUD-PDR-134
Prepared by Frosh, Lane and Edson, Washington, D.C. Paper 30 on National Housing Policy Study Papers. Background Studies. Volume 3.

Descriptors: *Building codes, *State legislation, *Prefabricated housing, *Federal policies, Constraints, Administrative guidelines, Structural characteristics, Quality assurance, Management, Evaluation, Inspection, State government, Control, Program implementation.
Identifiers: *Housing and urban development research, Reciprocity.

Evaluation is made of recent state legislation, and its administration designed to permit the state to approve manufactured housing for compliance with all applicable building codes and to supersede municipal authority to apply their own building code requirements. Purpose of the legislation is to create wider markets for manufactured housing and to facilitate adoption of new technologies. Legislative purposes have yet to be achieved because states have not agreed on a system of interstate reciprocity. The report recommends federal support for continuing state efforts.

PB-229 986/5GA PC$4.75/MF$1.45
Babcock and Wilcox Co., Alliance, Ohio. Research Center.
EFFECTS OF DESIGN AND OPERATING VARIABLES ON NOX FROM COAL-FIRED FURNACES. PHASE I.
Final rept.,
W. Joseph Armento. Jan 74, 143p* EPA-650/2-74-002a
Contract EPAZ-68-02-0634

Descriptors: *Air pollution, *Nitrogen oxides, *Combustion chambers, Coal, Boilers, Combustion products.
Identifiers: *Air pollution control.

The report gives results of Phase I of an investigation of combustion modification techniques for controlling NOx emissions from pulverized-coal-fired utility boilers. The techniques--studied on a 5-million Btu/hr single-burner pilot unit--included: excess air; air preheat; rating; flue gas recirculation; staged combustion; quench; and swirl. The study showed that NOx reductions of up to 50% are possible either using staged combustion or by lowering excess air levels from 30 to zero %. Flue gas recirculation yielded only moderate NOx reductions. Fuel-bound nitrogen conversion increased with increasing excess air level and decreasing temperature. At substoichiometric conditions, the final precursors for NO formation from either fuel-bound nitrogen or thermal atmospheric fixation appeared identical. For existing units, control of excess air promises to be the best method for NOx reduction; however, for new units, staging (with physical separation of the two stages) appears to be the most promising. (Author)

PB-230 002/8GA PC$4.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
ZONING. EXCLUSIONARY ZONING: STATE OF THE ART, STRATEGIES FOR THE FUTURE,
George Sterlieb, and David Listokin. 1973, 93p* HUD-PDR-108
Prepared by Rutgers Univ., New Brunswick, N.J. Center for Urban Policy Research. Paper 61 on National Housing Policy Study Papers. Background Studies. Volume 4.

Descriptors: *Housing studies, *Land use zoning, Reviews, Policies, State government, Local government, Legislation, Urban planning.
Identifiers: *Housing and urban development research, *Exclusionary zoning.

The study examines the issue of local zoning and evaluates strategies that have been and could be taken to modify local land use controls. Also the study focuses on policies that have been taken to counteract exclusionary zoning's allegedly harmful effects. Specifically it focuses on a number of fair share plans that have been either effected or proposed by states, county planning boards and others.

PB-230 037/4GA PC$6.00/MF$1.45
Skidaway Inst. of Oceanography, Savannah, Ga.
TRANSPORT, FATE AND GEOCHEMICAL INTERACTIONS OF MERCURY, CADMIUM AND OTHER INORGANIC POLLUTANTS IN THE COASTAL LITTORAL-SALT MARSH ENVIRONMENT OF THE SOUTHEASTERN UNITED STATES.
Annual progress rept. 1 May 73-31 Jan 74.
Jan 74, 246p* W74-05501
See also PB-227 035.

Descriptors: *Trace elements, *Swamps, *Geochemical cycles, *Water pollution, Coasts, South Carolina, Georgia, Estuaries, Sediment transport, Research projects, Geochemistry, Water Chemistry, Hydrography.
Identifiers: *Path of pollutants, *Salt marshes.

Contents:
- Completed research;
- Research in progress;
- Heavy metal fluxes through salt marsh estuaries;
- Organic and inorganic geochemistry of some coastal plain rivers of the southeastern United States;
- Chemical characteristics of dissolved organic matter in river water;
- A hydrographic investigation of Winyah Bay, South Carolina and the adjacent coastal waters;
- An improved ion-exchange technique for the concentration of manganese from sea water.

PB-230 047/3GA PC$5.50/MF$1.45
Texas Transportation Inst., College Station.
COMPUTER CONTROL OF THE WAYSIDE-TELEPHONE ARTERIAL STREET NETWORK.
Interim rept. Sep 71-Apr 73,
Carroll J. Messer, and Jim L. Gibbs. Apr 73, 49p
TTI-2-18-72-165-3
Sponsored in part by Texas Highway Dept., Austin. Prepared in cooperation with Department of Transportation. Report on Development of Urban Traffic Management and Control Systems.

Descriptors: *Traffic signals, *Travel time, Traffic surveys, Intersections, Freeways, Frontage roads, Benefit cost analysis, Evaluation, Vehicular traffic control.
Identifiers: *Traffic signal timing, *Computer controlled signals, Diamond interchanges.

The digital computer control of a small network of traffic signals near the Gulf Freeway is described. The disign and development of the traffic control system theory, software, and hardware are presented. Three types of traffic control strategies were implemented and evaluated. These were existing pretimed, progressive pretimed, and progressive traffic responsive control. Progressive traffic responsive control produced the most effective results.

PB-230 110/9GA PC$23.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
THE LAWS OF SEVEN SOUTHEASTERN STATES VIEWED FROM THE PERSPECTIVE OF RURAL HOUSING NEEDS,
Robinson O. Everett. 18 Jun 73, 404p HUD-PDR-123
Prepared by Duke Univ., Durham, N.C. Paper 16 on National Housing Policy Study Papers. Background Studies. Volume 2.

Descriptors: *Housing studies, *Rural areas, *Southeast US, *State legislation, Building codes, Banking practices, Loans, Mobile homes.

In northeastern states there are several statewide housing development corporations; a trend exists towards legislation providing uniform standards for mobile homes and factory - built housing; Virginia now has authorized statewide building code; wide diversity among states exists in usury laws, but generally there is exemption of FHA and VA loans; fair housing legislation is in effect in Kentucky, Virginia, and West Virginia, while otherwise landlord tenant law has remained almost unchanged; branch banking is generally prohibited or severly limited; and there is no remarkable environmental protection legislation.

PB-230 122/4GA PC$4.25/MF$1.45
Phoenix, Ariz.
THE PHOENIX IMIS (INTEGRATED MUNICIPAL INFORMATION SYSTEM) FEASIBILITY STUDY AND DEVELOPMENT PLAN. PHASE I. FEASIBILITY STUDY.
Final rept.
Apr 73, 22p
Prepared by System Development Corp., Phoenix, Ariz. Report no. TM-PH-001/000/00.
Paper copy also available from NTIS $96.00/set of 6 reports as PB-230 121-SET.

Descriptors: *Urban planning, *Data processing, *Information systems, Methodology, Systems analysis, Management information systems, Classifications, Recommendations, Local government, Computer technology, Feasibility, Automation, Arizona.
Identifiers: *Integrated municipal information systems, *Phoenix(Arizona), Advantages and disadvantages, Automated systems.

The document discusses the advantages and disadvantages of various approaches to municipal data processing. It then draws some conclusions, makes some recommendations regarding the approach most suitable for the city of Phoenix, and documents the characteristics of that approach.

PB-230 123/2GA PC$36.50/MF$1.45
Phoenix, Ariz.
PHOENIX IMIS (INTEGRATED MUNICIPAL INFORMATION SYSTEM) FEASIBILITY STUDY AND DEVELOPMENT PLAN. PHASE II. DEVELOPMENT PLAN. VOLUME IA. CURRENT SYSTEM DESCRIPTION AND IMIS FUNCTIONL REQUIREMENTS.
Final rept.
31 May 73, 667p
Prepared by System Development Corp., Phoenix, Ariz. Report no. TM-PH-001/001/00.
Paper copy also available from NTIS $96.00/set of 6 reports as PB-230 121-SET.

Descriptors: *Urban planning, *Management information systems, *Local government, Job analysis, Organizations, Classifications, Automation, Data files, Operations, Systems analysis, Feasibility, Arizona.
Identifiers: *Integrated municipal information systems, *Municipal functions, Automated systems, *Phoenix(Arizona).

The document describes 294 municipal functions identified as necessary for the support of current or planned city operations. These are assumed to be the functions required for an automated integrated municipal information system (IMIS) for the city of Phoenix. The document also provides background information on the management information system environment, and on source documents for future data base and IMIS module (function) design activities. Finally, the document lists the assumptions made by the study team.

PB-230 124/0GA PC$22.25/MF$1.45
Phoenix, Ariz.
PHOENIX IMIS (INTEGRATED MUNICIPAL INFORMATION SYSTEM) FEASIBILITY STUDY AND DEVELOPMENT PLAN. PHASE II. DEVELOPMENT PLAN. VOLUME IB. CURRENT SYSTEM DESCRIPTION AND IMIS FUNCTIONAL REQUIREMENTS. APPENDICES.
Final rept.
May 73, 385p
Prepared by System Development Corp., Phoenix, Ariz. Report no. TM-PH-001/002/00.
Paper copy also available from NTIS $96.00/set of 6 reports as PB-230 121-SET.

Descriptors: *Urban planning, *Local government, *Management information systems, *Computer technology, Data processing, Automation, Classifications, Records management, Operations, Systems analysis, Indexes(Documentation), Feasibility, Arizona.
Identifiers: *Integrated municipal information systems, *Phoenix(Arizona), Automated systems.

The document contains, as appendices, data generated during a study of municipal operations, and of projected automated integrated municipal information system (IMIS) operational functions, for Phoenix. The appendices are city department/division names; IMIS function names; IMIS logical records; IMIS functions required, per department and division; IMIS functions generating or contributing to each IMIS logical record; IMIS logical records or impacted, per IMIS function; and IMIS logical records used by each IMIS function.

PB-230 125/7GA PC$9.25/MF$1.45
Phoenix, Ariz.
THE PHOENIX IMIS (INTEGRATED MUNICIPAL INFORMATION SYSTEM) FEASIBILITY STUDY AND DEVELOPMENT PLAN. PHASE II. DEVELOPMENT PLAN. VOLUME 2A. DEVELOPMENT PLAN.
Final rept.
Jul 73, 121p
Prepared by System Development Corp., Phoenix, Ariz. Report no. TM-PH-001/003/00.

Paper copy also available from NTIS $96.00/set of 6 reports as PB-230 121-SET.

Descriptors: *Urban planning, *Computer technology, *Municipal information systems, Automation, Feasibility, Local government, Documentation, Systems analysis, Classifications, Cost analysis, Management systems, Arizona.
Identifiers: *Integrated municipal information systems, *Phoenix(Arizona), Automated systems.

The document is a plan for the development of an automated integrated municipal information system (IMIS) for the city of Phoenix. It includes a discussion of the impact of IMIS on Phoenix, a description of the IMIS development process, a description of IMIS system documentation, a description of the IMIS operational subsystems identified, a schedule for the logical sequencing of IMIS modules and subsystems, IMIS development cost schedules and cost assumptions, and a management plan for the development of IMIS.

PB-230 126/5GA PC$24.00/MF$1.45
Phoenix, Ariz.
PHOENIX IMIS (INTEGRATED MUNICIPAL INFORMATION SYSTEM) FEASIBILITY STUDY AND DEVELOPMENT PLAN. PHASE II. DEVELOPMENT PLAN. VOLUME 2B. APPENDICES TO DEVELOPMENT PLAN.
Final rept.
Jul 73, 416p
Prepared by System Development Corp., Phoenix, Ariz. Report no. TM-PH-001/004/00.
Paper copy also available from NTIS $96.00/set of 6 reports as PB-230 121-SET.

Descriptors: *Urban planning, *Municipal information systems, *Systems analysis, *Computer technology, Automation, Data processing, Records management, Linkages, Classifications, Feasibility, Local government, Arizona.
Identifiers: Modules, *Integrated municipal information systems, Automated systems, *Pheonix(Arizona).

The document contains information supportive of the development plan produced by the System Development Corporation for an automated integrated municipal information system (IMIS) for the city of Phoenix. The appendices give IMIS module descriptions, logical records per module, module linkages, and similar information necessary to the initiation of IMIS design activity.

PB-230 127/3GA PC$6.00/MF$1.45
Phoenix, Ariz.
THE PHOENIX IMIS (INTEGRATED MUNICIPAL INFORMATION SYSTEM) FEASIBILITY STUDY AND DEVELOPMENT PLAN. PHASE II. DEVELOPMENT PLAN. VOLUME 3. EXECUTIVE SUMMARY.
Final rept.
Jul 73, 59p
Prepared by System Development Corp., Phoenix, Ariz. Report no. TM-PH-001/005/00.
Paper copy also available from NTIS $96.00/set of 6 reports as PB-230 121-SET.

Descriptors: *Urban planning, *Municipal information systems, *Computer technology, Feasibility, Requirements, Cost analysis, Recommendations, Automation, Local government, Systems analysis, Methodology, Operations, Personnel, Arizona.
Identifiers: *Integrated municipal information systems, *Phoenix(Arizona), Municipal functions, Automated systems.

The document summarizes the content, conclusions, and recommendations of a study team report on the feasibility, cost, and developmental requirements of a projected, automated integrated municipal information system (IMIS) for the city of Phoenix.

PB-230 142/2GA PC$8.50/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
A PLAN FOR FEDERAL INTERIM ASSISTANCE.
Temporary draft rept.,
Peter R. Morris. 18 May 73, 106p HUD-PDR-408-b

Descriptors: *Residential buildings, *Urban renewal, Project planning, Neighborhoods, Rehabilitation, Central city, Financing.
Identifiers: *Housing and urban development research.

The objective of the paper is to develop a large scale interim housing rehabilitation program for inner-city neighborhoods on a national scale. Emphasis is placed on evaluating costs and priorities of present programs and in developing a subsidy mechanism that will be drastically reduced in per unit cost and incrementally increased in per unit coverage.

PB-230 148/9GA PC$5.00/MF$1.45
Systems Control., Inc., Palo Alto, Calif.
EXTENDED PERIOD SIMULATION OF WATER DISTRIBUTION NETWORKS.
Final technical rept.,
H. S. Rao, D. W. Bree, Jr., and R. Benzvi. Feb 74, 156p* W74-05533, OWRR-C-4164(9027)(1)
Contract DI-14-31-0001-9027

Descriptors: *Water distribution, *Network flows, *Computerized simulation, *Public works, Distribution systems, Reservoirs, Piplines, Pumps, Mathematical models, Newton-Raphson method, Control theory, California, FORTRAN.
Identifiers: WATSIM computer program, San Jose(California).

An extended period simulation procedure was developed for metropolitan water distribution networks. Efficient sparsity programming techniques were applied to obtain static network balances using a modified Newton-Raphson technique. An integration scheme was developed to link several static solutions each representing an interval of time. A program, called WATSIM, was developed and tested using field data provided by the San Jose Water Works, San Jose, California. Data included network data, switching data, parabolic characteristics of pumps, reservoir curves, and time varying demand patterns. Three cases were simulated: normal operation, emergency operation, and pump outage conditions. (Modified author abstract)

PB-230 199/2GA PC$4.75/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
THE RATIONALE FOR GOVERNMENT INTERVENTION IN HOUSING,
Richard F. Muth. 15 May 73, 32p HUD-PDR-117
Prepared by Stanford Univ., Calif. Paper 6 on National Housing Policy Study Papers. Background Studies. Volume 1.

Descriptors: *Housing studies, *Subsidy programs, Federal programs.
Identifiers: *Housing and urban development research.

The current suspension of federal housing subsidy programs provides an unusual opportunity to reappraise these programs. Indeed, the first question one ought to ask is 'Why have a housing program at all. Why not use the funds for general income subsidies instead.' The second section of this paper addresses these questions. The rationale for housing subsidies must be based either upon direct benefits to persons other than the subsidy recipient or upon an inability of the income subsidy recipient to purchase better housing on the private market if he chooses to do so. In the author's opinion there appears to be little rationale for preferring housing subsidies to general income subsidies. But given that for reasons of political necessity some form of federal housing program is required housing allowances are probably the most desirable. In the paper's final pages it is argued that, to maximize the benefits of a housing allowance, these allowances be made available to the whole of the lower-income population with certain conditions and limitations according to family size, etc.

PB-230 209/9GA PC$4.50/MF$1.45
Rivkin/Carson, Inc., Washington, D.C.
FEDERAL ACTION FOR ENVIRONMENTAL PROTECTION AND ITS POTENTIAL SIGNIFICANCE FOR HOUSING.
Final rept.
Jun 73, 27p HUD-PDR-001c
Contract HUD-H-2095

Descriptors: *Residential buildings, *Legislation, Environmental engineering, Water supply, Waste disposal, Air pollution, Standards.
Identifiers: *Housing and urban development research.

The report discusses many of the legislation acts and their potential effects for housing. The conclusion is that the environmental legislation and standards may become a two-edged sword; contributing to an increase in housing quality on the one hand and an increase in costs, a slow-down of production, and encouragement of sprawl of the other.

PB-230 211/5GA PC$2.00/MF$1.45
Highway Research Board, Washington, D.C.
HIGHWAY RESEARCH RECORD. PRICE-SUBSIDY ISSUES IN URBAN TRANSPORTATION.
1973, 63p HRB-Record-476, ISBN-0-309-02261-4
Library of Congress Catalog Card No. 74-184.
Paper copy also available from Highway Research Board, National Academy of Sciences, 2101 Constitution Ave., N.W. Washington, D.C. 20418 $2.00.

Descriptors: *Grants, *Urban transportation, Rapid transit railways, Buses(Vehicles), Financial management.

Papers in this Record examine the use of pricing and subsidy in urban transportation. Because of the inability of public transportation to cover capital and operating costs from its operating revenues, there is growing interest in looking to government to subsidize public transit operation and at the same time to use a pricing or taxing system to reduce urban traffic congestion at peak hours.

PB-230 212/3GA PC$11.50/MF$1.45
Iowa Univ., Iowa City. Dept. of Mechanics and Hydraulics.
VERTICLE MIXING OF HEATED EFFLUENTS IN OPEN-CHANNEL FLOW.
Doctoral thesis,
Eric John Schiller. Jul 73, 167p W74-05822, OWRR-A-040-IA(2)
See also PB-230 243.

Descriptors: *Cooling water, *Mixing, *Open channel flow, Computer programs, Heat transfer, Water pollution, Heat, Effluents, Turbulent flow, Theses.
Identifiers: *Thermal pollution.

The extensive use of rivers as a sink for heated effluents from thermal power plants has created widespread concern for the aquatic life in these waterways. The present study is an attempt to determine relevant parameters that can be used in the prediction of vertical mixing of heated surface effluents in the far-field mixing region. (Modified author abstract)

PB-230 220/6GA PC$18.50/MF$1.45
Delaware Univ., Newark. Dept. of Chemical Engineering.
THREE-DIMENSIONAL TURBULENT DIFFUSION FROM POINT SOURCES OF THERMAL POLLUTION IN A RECTANGULAR OPEN CHANNEL.
Master's thesis,
Dennis C. Prieve. May 73, 308p W74-05823, OWRR-A-015-DEL(2)

Descriptors: *Water pollution, *Cooling water, *Heat transfer, *Open channel flow, Theses, Turbulent flow, Mixing, Computer programs.
Identifiers: *Thermal pollution.

Cooling water requirements for the electric power generating industry constitute one of the major sources of thermal pollution. The work described herein presents: (1) a numerical solution of the steady state temperature field resulting from a continuous, point injection of a thermal pollutant into the turbulent-core region of a rectangular, open channel, (2) partial verification of the solution by experiments, (3) a means of extracting thermal and momentum diffusivities from temperature and velocity field measurements, and (4) a comparison of diffusivities thus obtained. Although the current work has emphasized the heat transfer problem, the techniques are also applicable to the analogous mass transfer problem.

PB-230 243/8GA PC$10.00/MF$1.45
Iowa Univ., Iowa City. Dept. of Mechanics and Hydraulics.
THE MIXING CHARACTERISTICS OF SUBMERGED MULTIPLE-PORT DIFFUSERS FOR HEATED EFFLUENTS IN OPEN CHANNEL FLOW.
Master's thesis,
John R. Argue. May 73, 138p W74-05821, OWRR-A-040-IA(1)
See also PB-230 212.

Descriptors: *Cooling water, *Open channel flow, *Jet mixing flow, Hydraulic models, Water pollution, Heat, Theses, Stratification.
Identifiers: *Thermal pollution.

The behavior of heated water jets discharging into a shallow, co-flowing environment was studied in a model which simulated the flow of cooling water from a prototype multiport diffuser discharging into a river or ocean current. The relative effects of jet interaction and surface distortion were considered. The port spacing distance was the most significant variable. Criteria for differentiating among well-mixed flows, moderately well-mixed flows and stratified flows were determined together with the relationship between mixing and distance. A procedure for designing multiport diffuser installations is suggested. (Modified author abstract)

PB-230 279/2GA PC$6.75/MF$1.45
Pennsylvania Univ., Philadelphia. Fels Center of Government.
THE USE OF URBAN MODELS IN URBAN POLICY MAKING: REPORT ON RESEARCH TO REFINE THE RELEVANT QUESTIONS AND TO PROVIDE AN APPROPRIATE RESEARCH DESIGN. VOLUME I,
Janet Rothenberg Pack. Jan 74, 278p URBMOD-1
Grant NSF-GI-37789
See also Volume 2, PB-230 280.

Descriptors: *Urban planning, *Local government, *Policies, Mathematical models, Computer aided design, Surveys, Organizations, Technology innovation.
Identifiers: *Urban models.

A planning and design study is documented in two volumes on the role and utility of large-scale computer based models in the formulation of urban policy at the local level. A survey of planning agencies use of urban models, three case studies of public agencies use of models, and a conference of modelers and model users are reported on in volume one, along with reviews of the literature on urban model use and organizational innovation.

PB-230 280/0GA PC$6.75/MF$1.45
Pennsylvania Univ., Philadelphia. Fels Center of Government.
THE USE OF URBAN MODELS IN URBAN POLICY MAKING: REPORT ON RESEARCH TO REFINE THE RELEVANT QUESTIONS AND TO PROVIDE AND APPROPRIATE RESEARCH DESIGN. VOLUME II. APPENDICES,
Janet Rothenberg Pack. Jan 74, 283p URBMOD-2
Grant NSF-GI-37789
See also Volume 1, PB-230 279.

Descriptors: *Urban planning, *Policies, *Research needs, Field tests, Interviews, Models, Meetings, Organizations, District of Columbia, Maryland, Virginia, Suburban areas.
Identifiers: *Urban models, *Innovations.

Volume two of a two volume planning and design study of the role and utility of large-scale computer based models in the formulation of urban policy at the local level reports on field work, conferences, and model development.

PB-230 293/3GA PC$3.25/MF$1.45
Rivkin/Carson, Inc., Washington, D.C.
THE SEWER MORATORIUM AS A TECHNIQUE OF GROWTH CONTROL AND ENVIRONMENTAL PROTECTION.
Final rept.
24 Jul 73, 34p* HUD-PDR-001-d
Contract HUD-H-2095

Descriptors: *Urban growth, *Arresting(Process), *Sewer systems, *Environmental engineering, Management methods, Control, Shortages, Water pipelines, Facilities, Licenses.
Identifiers: *Housing and urban development research, *Sewer moratoriums, *Permit denials.

The report gives as much information as possible about the sewer moratorium which has emerged as a new technique of growth control. Little appears available in the way of statistical studies but the author uses all available information to ascertain what effect this has had and if it is a good or bad technique to use.

PB-230 307/1GA PC$6.00/MF$1.45
Illinois Univ., Urbana. Dept. of Civil Engineering.
THE EFFECT OF TIME-DEPENDENT PROPERTIES OF ALTERED ROCK ON TUNNEL SUPPORT REQUIREMENTS.
Final rept.,
R. M. Semple, A. J. Hendron, and G. Mesri. Dec 73, 226p* UILU-ENG-73-2023 FRA-ORD/D-74-30
Contract DOT-FR-30022

Descriptors: *Tunnels, *Supports, *Soil dynamics, Rock mechanics, Underground supporting, Earth pressure, Creep properties, Time dependence, Geological faults.

Squeezing ground conditions in hard-rock tunneling are associated with fault zones containing brecciated rock and gouge. The time-dependent nature of the deformation and support loads in squeezing ground conditions suggest that the creep behavior of fault gouge is the significant engineering property controlling the in situ behavior. An experimental and analytical study is presented that deals with soil creep and its application to the prediction of tunnel support requirements in squeezing ground. Support requirements given by the theoretical analysis are compared to numerous case histories obtained from the published literature. Finally, specific consideration is given to squeezing conditions at Straight Creek and Pacheco tunnels. The analysis provides a method for estimating steel support requirements for tunnels at different depths and in various squeezing ground conditions. (Modified author abstract)

PB-230 326/1GA PC$3.25/MF$1.45
Linton, Meilds and Coston, Inc., Washington, D.C.
SCATTERED VS CONCENTRATED HOUSING REHABILITATION.
Final rept.,
Edward S. Hollander. Jul 73, 45p* HUD-PDR-303
Contract HUD-H-5059

Descriptors: *Housing restoration, *Urban renewal, Federal housing programs, Neighborhoods.
Identifiers: *Housing and urban development research.

The authors point out the different areas of strength of 'rehab' and urban renewal. Rehab and rehabilitation programs are defined and the differences between them are explained. Strengths and inadequacies of federal programs are discussed. The study stresses the importance of impact evaluation, that is, to use programs that fit the needs of the community Rehab is a light and early treatment, and can only be used in neighborhoods in which deterioration is slight. The neighborhoods in which deterioration is more severe, rehabilitation program in order to be successful, should be coordinated with community preservation efforts.

PB-230 356/8GA PC$4.00/MF$1.45
Metropolitan Transportation Commission, Berkeley, Calif.
HARBOR ACCESSIBILITY IN THE SAN FRANCISCO BAY AREA. A STUDY OF ITS FUNCTION AND ROLE IN THE REGIONAL TRANSPORTATION PLAN. VOLUME II
Final rept.,
Arthur J. Negrette, and Jack Knecht. 11 Jan 74, 82p MTC-SP-74-01
See also Volume 1, PB-230 355 and PB-230 357.

Descriptors: *Harbors, *Regional planning, *Marine transportation, *California, Bays(topographic features), Rapid transit railways, Traffic surveys, Cargo transportation, Waterway(Transportation).

The harbor access study is an initial effort by the Metropolitan Transportation Commission to evaluate existing surface transportation links which serve various San Francisco Bay Area maritime facilities. Major sub-sections include an historical perspective of maritime facilities and cargos in the Bay Area and current inventories of port terminals and access facilities. Section III (data and analysis of vehicular flows) includes a traffic study of port access facilities which identifies modal split, peaking characteristics, traffic volumes and roadway capacities. Findings and Recommendations are contained in Section IV.

PB-230 357/6GA PC$3.00/MF$1.45
Metropolitan Transportation Commission, Berkeley, Calif.
AIRPORT AND HARBOR ACCESSIBILITY IN THE SAN FRANCISCO BAY AREA. A STUDY OF THEIR FUNCTION AND ROLE IN THE REGIONAL TRANSPORTATION PLAN. LEGISLATIVE SUMMARY.
Final rept.,
Arthur J. Negrette. 11 Jan 74, 19p MTC-SPSP-74-01
See also Volume 2, PB-230 356.

Descriptors: *Airports, *Harbors, *Regional planning, *Transportation, *California, Bays(Topographic features), Rapid transit railways, Surveys, Travel.

The document presents a summary report detailing the findings and recommendations of the Metropolitan Transportation Commission's study on the role of airports and Harbors as they relate to the regional transportation plan. (Report No. MTC-SPSP-74-01) Abstracts of the Airport Accessibility Report and the Harbor Accessibility Report with a listing of relevant findings and recom-

mendations are included. The two separate reports are available as follows: (Airport Accessibility Report No. MTC-AP-74-01) (Harbor Accessibility Report No. MTC-SP-74-01)

PB-230 379/0GA PC$14.50/MF$1.45
EMCON Associates, San Jose, Calif.
SONOMA COUNTY SOLID WASTE STABILIZATION STUDY.
Interim rept.,
1974, 228p EPA-SW-530-65d
Grant PHS-ED-00351

Descriptors: *Solid waste disposal, *Earth fills, *Water pollution, Drainage, Leaching, Tests, Stabilization, Water, California.
Identifiers: *Sanitary landfills, Water pollution control, *Sonoma County(California).

This report documents the first 2 years of a 3-year demonstration projected sponsored by EPA and Sonoma County, Calif. The purpose of the project is twofold: (1) to investigate the stabilization of solid waste in a sanitary landfill by analyzing leachate, gas, temperature and settlement parameters, and (2) to determine the effect on solid waste stabilization of applying, under various operational modes, excess water, septic tank pumpings, and recycled leachate in a sanitary landfill. This report describes the investigation of the test site, construction, instrumentation, and site operations and discusses the data produced thus far through extensive monitoring. Tables and figures following this report summarize the detailed data presented in the appendices.

PB-230 380/8GA PC$4.00/MF$1.45
Ohio State Univ., Columbus. Water Resources Center.
TRANSFER OF HEAVY METAL POLLUTANTS FROM LAKE ERIE BOTTOM SEDIMENTS TO THE OVERLYING WATER.
Completion rept.,
L. J. Walters, Jr., and T. J. Wolery. Jan 74, 92p
421X W74-05956, OWRR-A-032-OHIO(1)
Prepared in cooperation with Bowling Green State Univ., Ohio.

Descriptors: *Water pollution, *Trace elements, *Lake Erie, Mercury(Metal), Chromium, Nickel, Geochemistry, Sediments, Mass transfer, Diagenesis, Water analysis.
Identifiers: Path of pollutants, Sediment water interactions.

The literature was searched to provide clues to general principles regarding the geochemical behavior of the heavy metal pollutants mercury, nickel, and chromium in lacustrine environments similar to that of Lake Erie, and the information gained was supplemented by experimental work to more closely define the transport phases in this particular lake and to determine how they might be affected by early diagenesis. Pertinent historical data was gathered from the industrial chemical literature to provide information on pollutant sources, especially the times of major plant openings and relative discharges, and this information was used in conjunction with other data from the literature, the experimental phase data, and 21 detailed depth profiles of each metal from sediment cores taken in various locations throughout the lake to put together an interpretation of the pollution problem regarding these metals in this lake.

PB-230 382/4GA PC$5.50/MF$1.45
North Carolina Water Resources Research Inst., Raleigh.
NITROGEN BUDGET OF A NORTH CAROLINA ESTUARY,
William G. Harrison, and John E. Hobbie. Jan 74, 187p UNC-WRRI-74-86 W74-05954, OWRR-B-052-NC(1)
Contract DI-14-31-0001-3917

Descriptors: *Pamlico River Estuary, *Nitrogen cycle, Primary biological production, Nutrients, North Carolina.
Identifiers: Limiting factors, Eutrophication.

The Pamlico River estuary of eastern North Carolina is a relatively oligotrophic ecosystem which is entering the initial stages of cultural eutrophication. The estuary is naturally rich in phosphorus and indirect evidence indicates that nitrogen probably limits primary production. Investigations into the various pathways of nitrogen movement and transformation were needed to determine the importance of nitrogen in controlling production in the estuary. In order to answer these questions, a study of the nitrogen cycle of the estuary was undertaken.

PB-230 433/5GA PC$4.50/MF$1.45
Mississippi State Univ., State College. Water Resources Research Inst.
MODEL AND PROTOTYPE ANALYSIS OF THE OLD RIVER DIVERSION ON THE MISSISSIPPI RIVER,
Patrick C. Harris, and William R. Posey. 1973, 26p W74-05961, OWRR-A-999-MISS(9c)
Prepared by Army Corps of Engineers, Vicksburg, Miss.

Descriptors: *Mississippi River, *Hydraulic models, *Louisiana, Atchafalaya River, Old River, Dams, Diverting, Flow control.

In order to prevent the capture of the Mississippi River by the Atchafalaya River, two control structures were built on the west bank of the Mississippi River approximately 10 miles upstream from Old River. A side draft developed at the entrance to the low sill control structure tending to pull tows toward the structure. A model of the reach was constructed at Waterways Experiment Station to develop a plan to improve the situation. The plan for improving the condition was to develop the pool along the left bank with the crossing near the entrance to the structure stabilizing the channel into its former alignment. The results of the model tests were that the dike field filled and the bar on the opposite side receded. By keeping the dike profiles low and sloping, scour around the dikes may be held to a minimum. This type of design allows the river to adjust slowly to a dike field rather than fight it. (Knapp-USGS)

PB-230 435/0GA PC$5.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Water Resources and Marine Sciences Center.
STUDIES IN THE ANALYSIS OF METROPOLITAN WATER RESOURCE SYSTEM. VOLUME VIII. SOME DATA AND METHODS FOR ANALYZING METROPOLITAN WASTEWATER RECLAMATION AND REUSE SYSTEMS.
Technical rept.,
Paul Jing-yea Yang, and Daniel P. Loucks. Jan 74, 152p TR-78 W74-05951, OWRR-C-3101-(3684)(4)
Contract DI-14-31-0001-3684

Descriptors: *Water reclamation, *Urban planning, *Systems analysis, Sewage treatment, Water treatment, Mathematical models, Optimization, Water quality, Water supply.

This study reviews some data and proposes some mathematical models that may be used to plan or design metropolitan wastewater reclamation and reuse systems. Specifically, optimization models have been developed for analyzing a wastewater reclamation project involving both water supply and water quality problems. The design problem examined involves the determination of least cost wastewater and water treatment plant capacities that satisfy water quantity and quality requirements at each water reuse site and also the quality constraints imposed on the waste receiving stream. In addition to developing a means of defining and evaluating alternative design for water reclamation and reuse systems that meet a variety of water quantity and quality requirements, the study also investigates the extent that water can be treated for reuse as an alternative in achieving water supply and pollution control objectives. (Modified author abstract)

PB-230 436/8GA PC$3.75/MF$1.45
North Carolina Water Resources Research Inst., Raleigh.
PUBLIC PARTICIPATION IN WATER POLLUTION CONTROL POLICY AND DECISION MAKING,
Adam Clarke Davis. Dec 73, 66p UNC-WRRI-74-88 W74-05953, OWRR-A-049-NC(3)
Contract DI-14-31-0001-3233

Descriptors: *Public opinion, Questionnaires, Publicity, Streams, North Carolina, Decision making, Methodology, State government, Social communication, Attitudes.
Identifiers: *Water pollution control, *Public hearings.

A study is described of public awareness and concern about stream pollution, and more particularly, about a series of public hearings on stream classification held by the North Carolina Board of Water and Air Resources. Telephone surveys of a random sample of households in the areas affected found: A generalized awareness of stream pollution; a concern about its importance; a tendency to see stream pollution as a major topic of state concern; a limited knowledge about state agencies; and little knowledge of the public hearings despite the efforts of the agency. Few respondents attended the public hearings. Analysis of attendance at the hearings tended to show a relatively low level of public participation. Representatives of organized activities whose activities were immediately affected were present.

PB-230 448/3GA PC$4.75/MF$1.45
Los Angeles City Dept. of Traffic, Calif. Bureau of Traffic Research.
THE IMPROVED EFFECTIVENESS OF TRAFFIC SIGNAL SYSTEMS EFFECTS OF CHANGES IN SIGNAL OPERATION ON TRAFFIC FLOW.
Final rept.,
D. S. Terry. Jan 73, 31p Staff-58.06

Descriptors: *Traffic signals, *Travel time, Traffic surveys, Control charts, Statistical analysis.
Identifiers: *Traffic signal timing, *Speed and delay data, Progressive signals.

Travel time data were collected before and after a major timing change in a network of 70 signalized intersections including four east-west and four north-south arteries to determine the length of time required for traffic to adjust to the revised signal operation. Traffic was assumed to have adjusted to the change (to be stabilized) on a given route when there was no significant change in either the mean travel time or the variance of travel time within repetitive 15-minute periods on successive weeks. There was found to be no consistent trend in the means of variances of route travel time over a period of four weeks, which indicated that either these measures are inadequate for the purpose, or there are no discernible day-to-day or week-to-week perturbations in driving habits attributable to a change in signal timing. (Author)

PB-230 449/1GA PC$13.75/MF$1.45
Texas Univ., Austin. Center for Highway Research.
PROBABILISTIC DESIGN CONCEPTS APPLIED TO FLEXIBLE PAVEMENT SYSTEM DESIGN.
Research rept.,
Michael I. Darter, and Ronald Hudson. May 73, 215p CFHR-1-8-69-123-18
Also available as Rept. no. TTI-1-8-69-123.

Descriptors: *Flexible pavements, Mathematical models, Design, Foundations, Subgrades, Road-

beds, Concrete pavements, Bituminous coatings, Bearing capacity, Vehicular traffic, Computer programs, Texas.

A theory and procedures were developed, based on classical reliability theory, to apply probabilistic design concepts to flexible pavement system design. The probabilistic theory and procedures have been both practical and useful as they have been implemented into the pavement design operations of the Texas Highway Department. Original implementation was with the deterministic FPS-7 program, which was modified to include some probabilistic design capability and renamed FPS-11. That version, which has been used by ten districts of the Texas Highway Department since late 1971, has been further developed to include variations occurring in individual pavement layers and subgrade, and the consideration of traffic forecasting error. The overlay mode was improved by making it possible to 'adjust' the performance model to a specific pavement by considering its past performance history, and the new program was named FPS-13 (CFHR).

PB-230 458-T/GA PC$4.75/MF$1.45
Federal Railroad Administration, Washington, D.C. Office of Research Development and Demonstrations.
HSB: STUDY OF A HIGH SPEED INTERCITY SURFACE TRANSPORTATION SYSTEM FOR GERMANY. VOLUME I. SYSTEM ANALYSIS AND RESULTS.
Rept. for Aug 69-Dec 71,
H. D. Neuber, A. Pennekamp, and V. H. Rothermel. 1972, 140p* FRA-ORD/D-74-26A
Technical trans. of Hochleistungs-Schnellbahn Studiengesellschaft mbH, Ottobrunn. Report (West Germany).
Paper copy also available from NTIS $37.00/set of 6 reports as PB-230 457-T-SET.

Descriptors: *Rapid transit railways, *West Germany, *Technology forecasting, *Urban transportation, Systems engineering, Systems analysis, Transportation models, Feasibility, Management, Mechanical engineering, Travel, Spacing, Scheduling, Defects, Structures, Trains, Translations.
Identifiers: *Intercity transportation.

Volume one of a six volume study of rapid intercity ground transportation planning in West Germany presents a general systems analysis survey involving transit models, operations management, structural designs, tariffs, and cost engineering.

PB-230 459-T/GA PC$5.50/MF$1.45
Federal Railroad Administration, Washington, D.C. Office of Research, Development and Demonstrations.
HSB: STUDY OF A HIGH SPEED INTERCITY SURFACE TRANSPORTATION SYSTEM FOR GERMANY. VOLUME II. ATTACHMENTS 1-6.
Rept. for Aug 69-Dec 71,
H. D. Neuber, A. Pennekamp, and V. H. Rothermel. 1972, 194p* FRA-ORD/D-74-26B
Technical trans. of Hochleistungs-Schnellbahn Studiengesellschaft mbH, Ottobrunn. Report (West Germany).
Paper copy also available from NTIS $37.00/set of 6 reports as PB-230 457-T-SET.

Descriptors: *Rapid transit railways, *West Germany, *Urban transportation, *Traffic models, Management methods, Traffic surveys, Computer aided design, Scheduling, Facilities, Allocations, Trains, Translations.
Identifiers: *Intercity transportation.

Volume two of a six volume study of high speed interurban rail transportation in West Germany discusses operational modes, traveling behavior of trains, line capacities, schedule modeling, mathematical analysis of transport assignment problems, and computer aided management.

PB-230 460-T/GA PC$9.00/MF$1.45
Federal Railroad Administration, Washington, D.C. Office of Research, Development and Demonstrations.
HSB: STUDY OF HIGH SPEED INTERCITY SURFACE TRANSPORTATION SYSTEM FOR GERMANY. VOLUME III. ATTACHMENT 7.
Rept. for Aug 67-Dec 71,
H. D. Neuber, A. Pennekamp, and V. H. Rothermel. 1972, 436p* FRA-ORD/D-74-26C
Technical trans. of Hochleistungs-Schnellbahn Studiengesellschaft mbH, Ottobrunn. Report (West Germany).
Paper copy also available from NTIS $37.00/set of 6 reports as PB-230 457-T-SET.

Descriptors: *Urban transportation, *West Germany, *Mechanical engineering, *Systems engineering, Rapid transit railways, Railroad tracks and roadbeds, Comfort, Dynamics, Electromagnetic fields, Brakes(Motion arresters), Guidance, Suspension systems(Vehicles), Ground effect machines, Tube vehicle systems, Propulsion, Energy transfer, Translations.
Identifiers: *Intercity transportation, Wheel rail dynamics.

Volume three of a six volume study of rapid transit planning for West German intercity rail systems deals with wheel rail interactions, passenger comfort, magnetic carrying and guidance or suspension systems, pneumatic supporting and guidance systems, dynamics of air cushion suspensions, gas turbines, diesel motors, power transmission, electrical energy supply and transmission, rotating electrical drives, brakes, and aerodynamic propulsion.

PB-230 461-T/GA PC$5.00/MF$1.45
Federal Railroad Administration, Washington, D.C. Office of Research, Development and Demonstrations.
HSB: STUDY OF A HIGH SPEED INTERCITY SURFACE TRANSPORTATION SYSTEM FOR GERMANY. VOLUME IV. ATTACHMENTS 8-13.
Rept. for Aug 69-Dec 71,
H. D. Neuber, A. Pennekamp, and V. H. Rothermel. 1972, 170p* FRA-ORD/D-74-26D
Technical trans. of Hochleistungs-Schnellbahn Studiengesellschaft mbH, Ottobrunn. Report (West Germany).
Paper copy also available from NTIS $37.00/set of 6 reports as PB-230 457-T-SET.

Descriptors: *Rapid transit railways, *West Germany, *Systems engineering, *Management planning, Railroad stations, Railroad tracks and roadbeds, Railroad bridges, Railroad tunnels, Information systems, Urban transportation, Maintenance management, Translations.
Identifiers: Intercity transportation.

The fourth volume in a six volume series on West German high speed ground transportation planning for intercity service contains materials on station design, both motor vehicle and rail, track elements, structures such as bridges and tunnels, information systems, and maintenance methods and concepts.

PB-230 462-T/GA PC$7.50/MF$1.45
Transportation Development Agency, Montreal (Quebec).
HSB: STUDY OF A HIGH SPEED INTERCITY SURFACE TRANSPORTATION SYSTEM FOR GERMANY. VOLUME V. ATTACHMENT 14.
Rept. for Aug 69-Dec 71,
H. D. Neuber, A. Pennekamp, and V. H. Rothermel. 1972, 336p* FRA-ORD/D-74-26E
Technical trans. of Hochleistungs-Schnellbahn Studiengesellschaft abH, Ottobrunn. Report (West Germany).
Paper copy also available from NTIS $37.00/set of 6 reports as PB-230 457-T-SET.

Descriptors: *Rapid transit railways, *West Germany, *Transportation planning, *Urban transportation, Management methods, Transportation networks, Transportation models, Algorithms, Passenger transportation, Containerizing, Cargo transportation, Automobiles, Traffic models, Distance, Market analyses, Translations.
Identifiers: *Intercity transportation, Autotrain.

Volume five of a six volume series on high speed rail transportation between cities in West Germany covers an algorithm for routing networks, automobile, truck, and passenger carriers, forecasting for 1985, transportation of containers and swap bodies, long haul freight, train frequency and capacity and waiting times, and optimum scheduling.

PB-230 463-T/GA PC$11.00/MF$1.45
Transportation Development Agency, Montreal (Quebec).
HSB: STUDY OF A HIGH SPEED INTERCITY SURFACE TRANSPORTATION SYSTEM FOR GERMANY. VOLUME VI. ATTACHMENTS 15-24.
Rept. for Aug 69-Dec 71,
H. D. Neuber, A.Pennekamp, and V. H. Rothermel. 1972, 652p* FRA-ORD/D-74-26F
Technical trans. of Hochleistungs-Schnellbahn Studiengesellschaft mbH, Ottobrunn. Report (West Germany).
Paper copy also available from NTIS $37.00/set of 6 reports as PB-230 457-T-SET.

Descriptors: *Rapid transit railways, *West Germany, *Transportation models, *Traffic models, Operations, Mathematical prediction, Trains, Passenger transportation, Scheduling, Aerodynamic characteristics, Concepts, Automation technology, Translations.
Identifiers: *Intercity transportation.

The final volume of a six volume series on planning for a high speed rail transportation system in West Germany between cities develops several traffic models, discusses investments and benefit cost analysis, considers some track sharing possibilities, and makes some recommendations.

PB-230 484/8GA PC$17.75/MF$1.45
Washington State Univ., Pullman. Dept. of Political Science.
THE COLUMBIA INTERSTATE COMPACT: POLITICS OF WATER RESOURCES IN THE PACIFIC NORTHWEST.
Doctoral thesis,
Harvey Ray Doerksen. 1974, 292p W74-05957, OWRR-A-055-WASH(2)
Contract DI-14-31-0001-3848

Descriptors: *Pacific Northwest, *Water resources, Columbia river, Management, Washington(State), Regional planning, Political systems, River basin development, Negotiations, Theses.
Identifiers: *Columbia Interstate Compact.

The Columbia Interstate Compact represented an attempt to establish a regional institutional mechanism for river basin development. This study is a history of the Compact negotiations, describing the efforts of the seven states in the context of the political environment in which the Compact was negotiated. Several factors which contributed to the ultimate dissolution of the negotiating effort are analyzed in some depth. The most devastating defeat of the Compact attempt came in the Washington Legislature. There the Compact became embroiled in the existing conflict regarding power generation and marketing. Although the Compact effort may be dead, most issues with which it dealt, including allocation of water, reservation of power for states in which a dam is constructed, and out-of-basin diversion, are very much alive.

PB-230 515/9GA PC$3.00/MF$1.45
Ohio State Univ., Columbus. Water Resources Center.

CHEMICAL AND SEDIMENT MOVEMENT FROM AGRICULTURAL LAND INTO LAKE ERIE.
Project Completion rept. 30 Jun-30 Sep 72,
G. O. Schwab, and E. O. McLean. Nov 73, 18p
390X W74-05955, OWRR-A-018-OHIO(2)
Contract DI-14-01-0001-3535
See also PB-213 192.

Descriptors: *Sediment transport, *Surface water runoff, *Tile drains, *Lake Erie, Data, Water quality, Trace elements, Pesticides, Fertilizers, Ohio, Nutrients.

Water quality from tile drains and surface runoff was measured from half acre plots on Toledo silty clay soil near Sandusky, Ohio, in 1972. Crop was oats in early part of the growing season followed by plowing and seeding to alfalfa in September. Growing season sediment losses from the tile drains were 3,714 lbs per acre in 1972 compared to an average of 1,071 lbs per acre for 1969-71. The corresponding losses from surface drains were 6,854 and 1,287 lbs per acre. All pesticide losses were insignificant, but none were applied in 1972. Annual losses of eight heavy metals in 1972 were estimated to be less than 10 lbs per acre, except for iron (34-59) and lead (11-15 lbs per acre).

PB-230 615/7GA PC$4.50/MF$1.45
New Mexico State Univ., University Park. Water Resources Research Inst.
AN ANALYTICAL INTERDISCIPLINARY EVALUATION OF THE UTILIZATION OF THE WATER RESOURCES OF THE RIO GRANDE IN NEW MEXICO: SOCORRO REGION.
Partial technical completion rept.,
Robert R. Lansford, Shaul Ben-David, Thomas G. Gebhard, Jr., William Brutsaert, and Bobby J. Creel. Dec 73, 107p WRRI-023 W74-06103, OWRR-A-045-NMEX(4)

Descriptors: *New Mexico, *Water resources, *Economic models, River basin development, Rio Grande River, Surface waters, Ground waters, Utilization.

An interdisciplinary approach to the solution of the water resource problems of the Socorro Region in New Mexico was centered around a socio-economic model, developed to represent the New Mexico economy, with special emphasis placed upon the Rio Grande region. Inputs into the socio-economic model were obtained from separate studies covering the hydrological, agricultural, municipal, and industrial areas. Three sets of alternatives were considered: (1) growth without a water constraint; (2) growth, with a surface-water constraint; (3) growth, with both surface- and ground-water constraints. (Modified author abstract)

PB-230 616/5GA PC$5.50/MF$1.45
Pittsburgh Univ., Pa. Graduate School of Business.
APPLICABILITY OF PROGRAMMING MODELS TO PRICING AND RISK CONTROL IN WATER RESOURCE MANAGEMENT.
Completion rept.,
Robert F. Byrne, and Michael H. Spiro. Mar 73, 180p* W74-06104, OWRR-A-028-PA(1)
Contract DI-14-31-0001-3838

Descriptors: *Water resources, *Management planning, Bibliographies, Mathematical models, Water pollution, Cost analysis, Benefit cost analysis.
Identifiers: Risk analysis.

The applicability of programming models to problems in water resource management was evaluated. A comprehensive literature survey was made, and an annotated bibliography was prepared. A variety of simple two-and three-user models were examined. The most interesting model formulation appeared to be one minimizing the costs of supplying the needs of these users subject to constraints on supply and on the levels of various pollutants. The behavior of the solutions to the models was examined utilizing hypothetical cost data. In particular, the shadow prices (or opportunity costs) to the various users were examined in relationship to costs. The investigations indicated that programming models can be of value in examining some of the broader issues in water resource management. (Modified author abstract)

PB-230 619/9GA PC$6.00/MF$1.45
INTASA, Menlo Park, Calif.
MULTIOBJECTIVE PLANNING FOR MULTIPLE PURPOSE WATER RESOURCE SYSTEMS: A STRUCTURE FOR REGIONAL WATER RESOURCE DEVELOPMENT.
Final rept.,
D. P. Lijesen, A. P. Delarue, J. Rosing, L. T. Brekka, and J. L. Poage. Nov 73, 232p* IRP-72-02 W74-06106, OWRR-C-4264(9042)(1)
Contract DI-14-31-0001-9042

Descriptors: *Water resources, *Management planning, Methodology, Land use, Water supply, Reservoirs, Evaluation, Recreation, Flood control, Objectives, Cost estimates.

Six key phases are identified for the integrated process of planning and evaluation of multiple purpose, multiobjective water resource systems: Need identification, formulation of alternative systems, assessment of impacts, evaluation, display and implementation. Within the process, three major problem areas which contribute significantly to the complexity of the process are identified, analyzed and illuminated through the use of carefully selected case studies. The case studies currently in the planning stage are used to demonstrate three practical planning tools: comparative analysis of alternative land use plans used to delineate economic and social impacts of different land uses and analyze their implications for water resource planning; tradeoff analysis used to assess the importance of benefit tradeoffs between flood control and urban recreation; sensitivity analysis usedto determine necessary changes in the design and operation of a system designed primarily for water supply in order to better accomodate other purposes. Finally, a stepwise procedure for planners is given, together with an outline of priority research areas.

PB-230 624/9GA PC$17.75/MF$1.45
Smith (Wilbur) and Associates, Columbia, S.C.
READING-BERKS TRANSIT STUDY, READING, PENNSYLVANIA.
Sep 73, 291p UMTA-PA-09-0017-73-1

Descriptors: *Bus lines, *Financing, *Routing, Economic analysis, Management planning, Buses(Vehicles), Urban transportation, Grants, Pennsylvania.
Identifiers: *Bus usage, Reading(Pennsylvania).

The objective of the report was to develop recommendations for a five-year transit improvement program designed to address the transit problems of declining patronage, financial losses, and inadequate service in Reading and Berks County, ennsylvania. Topics considered are a recommended management plan, transportation authority formation, feasible extent of transit services, system alternatives, recommended service levels, fare level tests, detailed passenger projection, transit-oriented street improvements, equipment and facilities, rider amenities and field supervisory and safety improvements. Text material is supported by maps, tables, survey data, graphs and figures.

PB-230 642/1GA PC$3.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
A RATIONALE FOR GOVERNMENT INTERVENTION IN HOUSING: DIVERSITY IN COMMUNITY BUILDING CODES ACTS TO CONSTRAIN THE NATIONAL EFFECTIVENESS OF THE HOUSING TECHNICAL COMMUNITY.
Final rept.,
Rudard A. Jones. Jun 73, 23p* HUD-PDR-140
Prepared by Illinois Univ., Urbana. Small Homes Council-Building Research Council. Paper 10 on National Housing Policy Study Papers. Background Studies. Volume 2.

Descriptors: *Housing studies, *Building codes, Standards, Control, Federal policies, State government.
Identifiers: *Housing and urban development research.

The study addresses the question of whether or not there could and should be a single national building code. Many advantages and disadvantages to this are presented. The author concludes that it is apparent that some means must be found whereby unification of codes can be accomplished by the federal government while the control of code administration remains in the hands of the states.

PB-230 691/8GA PC$4.25/MF$1.45
Central Midlands Regional Planning Council, Columbia, S.C.
CITY OF CAYCE RECONNAISSANCE SURVEY.
Final rept.
Sep 73, 23p SC-40-0014-0716

Descriptors: *Urban planning, *South Carolina, Urbanization, Roads, Sanitary engineering, Public utilities.
Identifiers: *Cayce(South Carolina), *Lexington County(South Carolina).

The survey was conducted to identify problems and needs of the locality that can be beneficially affected by planning. A comprehensive planning program tailored to the locality's needs was devised.

PB-230 692/6GA PC$3.25/MF$1.45
Wisconsin Univ., Milwaukee. School of Architecture.
INVESTIGATION OF TRANSPORTATION RIGHTS OF WAY AND THEIR DIRECTLY RELATED LAND USE,
Robert M. Beckley, and Dale Swenson. Oct 72, 50p* UMTA-WI-11-0003-72-1
Contract DOT-UT-254

Descriptors: *Route surveys, *Right of way acquisition, *Land use, Urban planning, Traffic surveys, Urban transportation, Vehicular traffic, Wisconsin.
Identifiers: Urban highways, Arterial streets, Milwaukee(Wisconsin).

The report proposes a methodology for evaluating the relationship of existing rights-of-way and their adjacent land uses. Primary steps include attempts at classification of typical public rights-of-way by type, adjacent land uses, and special features of urban landscape. The question initially confronted was; what makes one right-of-way different from another. Shadow determinance charts are presented. Right-of-way perspective is examined from vista view, traffic flow, right-of-way pattern, speed limit aspects. Adjacent land uses discussion includes parking status, pedestrian traffic, access to right-of-way, road surface and traffic land constraints. Land use map and zoning map included, as well as traffic flow constraints. Authors conclude that systematic method of collecting and comparing data can be useful in defining type and character of right-of-way.

PB-230 702/3GA PC$4.00/MF$1.45
Oregon State Univ., Corvallis. Water Resources Research Inst.
HOW EFFECTIVE ARE ENVIRONMENTAL IMPACT STATEMENTS.
Jul 73, 85p* SEMN-WR-017.73 W74-06107, OWRR-A-999-ORE(15)

Descriptors: *Environmental impact statements, *Natural resources, Electric power production, Project planning, Evaluation, Decision making, Social change, Legislation, National government, Highways, Benefit cost analysis.

The Environmental Impact Statement is defined, its effects on the policies and programs of the Atomic Energy Commission, Bureau of Reclamation, Corps of Engineers, and the Oregon Highway Division examined, and suggestions are made on ways to improve the statements. Criticism of the statements centers on their failure to define impacts to be studied, to provide measurement tools, and to increase local participation in environmental planning. While the statements have forced agencies to be aware of environmental impacts, the increased workloads have caused the statements to be a separate rather than an integral part of the planning process. The development of a composite score, formed by examining the project's impact on the ecology, economy, and health and safety of the region is suggested as one way of selecting the best alternative. Regional information gathering systems are proposed to better integrate environmental impacts and public concern into the planning process.

PB-230 756/9GA PC$6.25/MF$1.45
Envirex Inc., Milwaukee, Wis. Environmental Sciences Div.
DEVELOPMENT OF A HIGH PRODUCT WATER RECOVERY SYSTEM FOR THE TREATMENT OF ACID MINE DRAINAGE BY REVERSE OSMOSIS.
Progress rept.,
Mahendra K. Gupta. Mar 74, 62p INT-OSW-RDPR-74-939
Contract DI-14-30-3020

Descriptors: *Mine waters, *Industrial waste treatment, *Osmosis, Neutralizing, Membranes, Calcium sulfates, Brines, Cost estimates, Capitalized costs, Operating costs.
Identifiers: *Mine acid drainage, Water pollution control.

The objective of this study was to develop a high product water recovery reverse osmosis (RO) system for the treatment of acid mine drainage. Depending on raw water quality the overall water recovery was limited to about 95% because of the buildup of saturation concentrations of calcium sulfate. Brines saturated with CaSO4 were produced via a portable RO unit employing hollow fiber B-9 membranes for a number of neutralization and softening tests. Various alkaline agents such as lime, limestone, sodium hydroxide and soda ash were evaluated for the neutralization of the brines produced from the first stage RO processing of raw acid mine waters. (Modified author abstract)

PB-230 757/7GA PC$7.50/MF$1.45
Lower Savannah Regional Planning and Development Council, Aiken, S.C.
ANNEXATION STUDY: AIKEN, SOUTH CAROLINA.
Sydney Carter. Feb 74, 88p SC-40-0014-0769
Prepared in cooperation with Aiken Planning and Zoning Commission, S.C., and Sydney Carter, Augusta, Ga.

Descriptors: *Urban planning, Extensions, Urban areas, Builtup areas, Land use, Public utilities.
Identifiers: *Aiken(South Carolina), *Annexation.

The study evaluates the feasibility of annexing the developed areas on the fringes of the city of Aiken. The study delineates the area to be considered for annexation and divides this proposed annexation area into study areas. The study examines in detail the characteristics of each of these areas, establishes the service requirements of the study areas, and proposes a plan for meeting the utility and service needs. The study evaluates the capabilities of the city to finance the proposed improvements and expanded services, and recommendations are made on the sequence and priorities of implementation.

PB-230 760/1GA PC$6.75/MF$1.45
Peat, Marwick, Mitchell and Co., Washington, D.C.
NETWORK FLOW SIMULATION FOR URBAN TRAFFIC CONTROL SYSTEM. PHASE II. VOLUME 1. TECHNICAL REPORT.
Final rept.,
R. D. Worrall, R. A. Ferlis, and E. Liberman. Mar 74, 282p* FHWA-RD-73-83
Contract DOT-FH-11-7885
Prepared in cooperation with KLD A ssociates, Inc., N.Y.
Paper copy also available from NTIS $23.00/set of 5 reports as PB-230 759-SET.

Descriptors: *Vehicular traffic control, *Traffic signals, *Urban transportation, Digital simulation, Networks, Vehicular traffic, Calibration, Sensitivity, Computer programming, Coding, Executive routines, Input output routines, FORTRAN.
Identifiers: FORTRAN 4 programming language.

'UTCS-1' is a digital simulation model of an urban street network. It is designed to be used by the traffic engineer as a means for evaluating alternative network control strategies. Particular emphasis is placed on the evaluation of relatively sophisticated signal control schemes. The model was developed in two phases. Phase I included the preparation of the basic simulation program, together with the calibration and validation of the model against field data collected for a test network in downtown Washington, D.C. The results of the Phase I study are summarized in an earlier report. This report summarizes the results of the second phase of model development. It includes a discussion of a series of revisions and extensions made to the original formulation, the results of an extensive set of sensitivity and demonstration tests, and a description of the initial application of the model in support of the Office of Research's 'Urban Traffic Control System (UTCS)' program.

PB-230 761/9GA PC$5.75/MF$1.45
Peat, Marwick, Mitchell and Co., Washington, D.C.
NETWORK FLOW SIMULATION FOR URBAN TRAFFIC CONTROL SYSTEM. PHASE II.VOLUME 2. PROGRAM DOCUMENTATION FOR UTCS-1. NETWORK SIMULATION MODEL. PART I.
Final rept.,
R. D. Worrall, and E. Lieberman. Mar 74, 207p* FHWA-RD-73-84
Contract DOT-FH-11-7885
Prepared in cooperation with KLD Associates, Inc., N.Y.
Paper copy also available from NTIS $23.00/set of 5 reports as PB-230 759-SET.

Descriptors: *Vehicular traffic control, *Traffic signals, *Urban transportation, Digital simulation, Networks, Vehicular traffic, Calibration, Sensitivity, Computer programming, Coding, Executive routines, Input output routines, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The manual contains detailed program documentation for the expanded version of the UTCS-1 Network Simulation Model, dated May 1, 1973. The first section gives a brief description of each of the 60 routines making up the model. The second section covers program documentation for each routine, including the program abstract; flow chart(s); input, operational and output specifications; definition of error handling techniques; and supplementary programming notes. The final section documents the 'COMMON' storage arrays and scalar descriptions used by the model.

PB-230 762/7GA PC$5.50/MF$1.45
Peat, Marwick, Mitchell and Co., Washington, D.C.
NETWORK FLOW SIMULATION FOR URBAN TRAFFIC CONTROL SYSTEM. PHASE II. VOLUME 3. PROGRAM DOCUMENTATION FOR UTCS-1. NETWORK SIMULATION MODEL. PART II.
Final rept.,
R. D. Worrall, and E. Lieberman. Mar 74, 198p* FHWA-RD-73-85
Contract DOT-FH-11-7885
Prepared in cooperation with KLD Associates, Inc., N.Y.
Paper copy also available from NTIS $23.00/set of 5 reports as PB-230 759-SET.

Descriptors: *Vehicular traffic control, *Traffic signals, *Urban transportation, Digital simulation, Networks, Vehicular traffic, Calibration, Sensitivity, Computer programming, Coding, Executive routines, Input output routine, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The manual contains detailed program documentation for the expanded version of the UTCS-1 Network Simulation Model, dated May 1, 1973.

PB-230 763/5GA PC$5.75/MF$1.45
Peat, Marwick, Mitchell and Co., Washington, D.C.
NETWORK FLOW SIMULATION FOR URBAN TRAFFIC CONTROL SYSTEM. PHASE II. VOLUME 4. USER'S MANUAL FOR UTCS-1. NETWORK SIMULATION MODEL.
Final rept.,
R. D. Worrall, and E. Lieberman. Mar 74, 215p* FHWA-RD-73-86
Contract DOT-FH-11-7885
Prepared in cooperation with KLD Associates, Inc., N.Y.
Paper copy also available from NTIS $23.00/set of 5 reports as PB-230 759-SET.

Descriptors: *Vehicular traffic control, *Traffic signals, *Urban transportation, Digital simulation, Networks, Vehicular traffic, Calibration, Sensitivity, Computed programming, Coding, Executive routines, Input output routines, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The doucument contains a general users' guide for the revised version of the 'UTCS-1' Network Simulation Model. It is written primarily for use by computer systems and research personnel. The guide includes six major sections, covering: (1) description of revised 'UTCS-1' model; (2) input data requirements and procedures for input coding; (3) interpretation of model outputs; (4) detailed operating instructions; (5) error messages; and (6) an illustrative case study.

PB-230 764/3GA PC$3.75/MF$1.45
Peat, Marwick, Mitchell and Co., Washington, D.C.
NETWORK FLOW SIMULATION FOR URBAN TRAFFIC CONTROL SYSTEM. PHASE II. VOLUME 5. APPLICATIONS MANUAL FOR UTCS-1. NETWORK SIMULATION MODEL.
Final rept.,
R. D. Worrall. Mar 74, 74p* FHWA-RD-73-87
Contract DOT-FH-11-7885
Prepared in cooperation with KLD Associates, Inc., N.Y.
Paper copy also available from NTIS $23.00/set of 5 reports as PB-230 759-SET.

Descriptors: *Vehicular traffic control, *Traffic signals, *Urban transportation, Digital simulation, Networks, Vehicular traffic, Calibration, Sensitivity, Computer programming, Coding, Executive routines, Input output routines, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The manual summarizes the potential applications which may be made of the revised UTCS-1 Network Simulation Model by the practicing traffic engineer. It is divided into separate sections covering: A simple description of the model; Guidelines for model application; Summary of potential applications; Selected demonstrations; and Estimated manpower and resource requirements.

PB-230 785/8GA PC$14.00/MF$1.45
Kentucky Univ., Lexington. Coll. of Engineering.
WASTEWATER ASSIMILATION CAPACITY OF WATER QUALITY LIMITED STREAM SEGMENTS IN KENTUCKY.
Final rept.,
Edward G. Foree. Feb 74, 217p UKY-TR80-74-CE20

Descriptors: *Water pollution, *Assimilation, *Streams, Kentucky, Aeration, Dissolved gases, Oxygen, Predictions, Effluents.

Detailed evaluations were made of the wastewater assimilation capacity of five stream segments in Kentucky. These segments represented a wide spectrum of characteristics: size from small to large; slope from flat (impounded) to steep; natural reaeration capacity from minimal to moderately high; and effluent quality received from well- to poorly-stablized. The field and experimental work was centered around the determination of stream reaeration capacity using tracer techniques. Rhodamine WT dye, and the radioactive tracers, tritium and krypton-85, were used. Using the generalized stream parameters, nomograph-type plots were developed to correlate predicted minimum dissolved oxygen concentration with available upstream dilution, stream reaeration capacity, and effluent quality (quantified by the effluent strength factor). Special attention was given to the prediction of the degree of treatment required to meet minimum dissolved oxygen concentration standards for the case of zero upstream dry weather flow. (Modified author abstract)

PB-230 810/4GA PC$6.75/MF$1.45
University of Southern California, Los Angeles. Inst. of Aerospace Safety and Management.
RISK ANALYSIS IN HAZARDOUS MATERIALS TRANSPORTATION. VOLUME I.
Risk analysis project (Final), Jun 72-Mar 73,
George P. Jones, Robert W. Barrow, Linn C. Stuckenbruck, Eugene L. Holt, and Robert P. Keller. Mar 73, 297p* RAPO-73-7 DES-20-73-4-1
Contract DOT-OS-20114

Descriptors: *Hazardous materials, *Cargo transportation, *Risk, Mathematical models, Accidents, Costs, Criteria, Chemicals, Materials handling, Safety, Liabilities, Forecasting, Damage, Containers, Classification, Management planning, Propane, Information, Liquefied gases, Pesticides, Highway transportation, Rail transportation.
Identifiers: *Hazardous materials transportation, Methyl parathion.

A contracted research project was undertaken by the University of Southern California for the Office of Hazardous Materials, Department of Transportation, on the subject topic. The results are as follows: (1) A risk analysis model is developed which is provided with input from existing data bases with some minor extensions and revisions and is logically consistent and satisfying. In fact, several agencies are already employing like models in analysis and operations; (2) Twenty examples are shown which demonstrate the procedure, its flexibility in accepting different levels of detail of data, and the type of results which are obtainable. In this phase several specific recommendations for data input needs and procedural development are made; and (3) The petition evaluation shows a clear dominance of one alternative over the other in terms of risk, bodily injury, deaths (equal), normal and total cost. It was not considered justified to generalize from the results to specify the exclusive use of the chosen alternative as factors beyond those considered were involved.

PB-230 811/2GA PC$8.50/MF$1.45
University of Southern California, Los Angeles. Inst. of Aerospace Safety and Management.
RISK ANALYSIS IN HAZARDOUS MATERIALS TRANSPORTATION. VOLUME II. BIBLIOGRAPHY.
Risk analysis project (Final), Jun 72-Mar 73,
George P. Jones, and Robert W. Barrow. Mar 73, 425p* RAPO-73-8 TES-20-73-5-2
Contract DOT-OS-20114
See also PB-230 810.

Descriptors: *Hazardous materials, *Cargo transportation, *Bibliographies, Risk, Abstracts, Materials handling, Safety.
Identifiers: *Hazardous materials transportation.

This is the second of two volumes prepared under the Risk Analysis in Hazardous Materials Transportation contract awarded by OHM/DOT. It is divided into two major sections. Section 1 contains relevant bibliographic entries and abstracts from among Department of Defense publications and Governmental Research Abstracts. Section 2 is merely a concise listing of all bibliographic entries gathered over the course of the entire project. All of the entries in this section have been previously shown in Monthly Progress Reports between June and December 1972.

PB-230 871/6GA PC$8.00/MF$1.45
Temple Univ., Philadelphia, Pa. Bureau of Economic and Business Research.
NEW BUSINESS AND URBAN EMPLOYMENT OPPORTUNITIES.
Final rept.,
Kenneth McLennan, and Paul Seidenstate. 1972, 356p DLMA-81-40-69-20-1
Contract DL-81-40-69-20

Descriptors: *Employment, *Urban planning, *Commerce, Economic development, Urban areas, Urban relocation, Manpower utilization, Pennsylvania.
Identifiers: Jobs, Philadelphia(Pennsylvania).

The study investigated the effects of business movement into, out of, and within the Philadelphia area on employment by occupation, type, and characteristics of industry. It also analyzed the geographic concentration of employment by industry in relation to residence of workers and commuting paterns, and factors affecting firms' choice of location. Data were obtained from firms which, during 1967, entered or left the central city, changed location within the central city, and entered or left a suburban county within the Philadelphia area. In addition, 1968 employment data were obtained for all firms in the city, by location and industry.

PB-230 919/3GA PC$4.50/MF$1.45
Transportation Systems Center, Cambridge, Mass.
THE TRANSPORTATION AIR POLLUTION STUDIES (TAPS) SYSTEM.
Interim rept. Jun 72-May 73,
David S. Prerau, and Paul J. Downey. Mar 74, 123p DOT-TSC-OST-73-24

Descriptors: *Air pollution, *Computer programs, *Model tests, Atmospheric models, Computerized simulation, Data storage, Data retrieval, Mathematical models, Performance evaluation, Highways, Airports.
Identifiers: TAPS(Transportation Air Pollution Studies), Transportation air pollution studies.

The report describes the Transportation Air Pollution Studies (TAPS) Data Base and the Software System which has been developed in association with it. The TAPS Data Base will be used to store the transportation air pollution data (including emissions, meteorological and other data) which are required for the TSC model validation program. The TAPS System is a package of computer programs for storing, manipulating and retrieving data. The system also contains routines for analyzing the performance of dispersion models as well as programs to generate both tabular and graphical output. Users guides for both the storage and retrieval programs of the TAPS System are included as well as examples of how these programs might be used. The report also contains complete listings for the TAPS System.

PB-230 941/7GA PC$9.75/MF$1.45
Envirex Inc., Milwaukee, Wis. Environmental Sciences Div.
EFFECT OF CARBON TO NITROGEN RATIO ON ACTIVATED SLUDGE SUBSIDENCE AND DEWATERING CHARACTERISTICS.
Final rept. 1970-73,
Anthony Geinopolos. 12 Mar 74, 135p EPA-670/2-74-025
Contract EPA-14-12-820

Descriptors: *Activated sludge process, *Dewatering, Nutrients, Carbon, Nitrogen, Ratios, Pilot plants, Pulp mills, Industrial waste treatment.

A field investigation was conducted to determine the effect of organic carbon to ammonia nitrogen ratio (C/N) on activated sludge subsidence and dewatering characteristics. C/N changes were made on one of two full-scale activated sludge systems of a pulp and paper mill. Bench scale tests were used to evaluate and compare the effect on solids subsidence characteristics. Pilot flotation thickening and pilot vacuum filtration tests were performed to evaluate and compare the effect on dewatering characteristics. (Modified author abstract)

PB-231 001/9GA PC-GPO/MF$1.45
Federal Highway Administration, Washington, D.C.
HIGHWAY STATISTICS, 1972.
Annual rept.
Mar 74, 226p
See also PB-218 949.
Paper copy available from GPO $3.20 as stock no. SN5001-00066, TD2.110:972.

Descriptors: *Highways, *Motor vehicles, Statistical data, Fuel consumption, Licences, Roads, Revenue, Cost analysis.

The publication presents the 1972 statistical and analytical tables of general interest on motor fuel, motor vehicles, driver licensing, highway-user taxation, State highway finance, highway mileage, and Federal aid for highways; and 1971 highway finance data for municipalities, counties, townships, and other units of local government.

PB-231 019/1GA PC$6.00/MF$1.45
National Association of Regional Councils, Washington, D.C.
HOUSING REPORTER NEWSLETTER. COMPLETE SET.
Final newsletter Aug 72-Jul 73.
Jul 73, 56p
Contract DC-PD-27

Descriptors: *Housing studies, *Periodicals, Federal housing programs, Building codes, Technical assistance programs.
Identifiers: *Housing and urban development research.

The document is a volume of the Housing Reporter newsletter generated during the second year of the National Association of Regional Councils and HUD housing project. Newsletters provided housing specialists with the latest information on regional council and federal housing programs. The final issue was a 12-page summary of what regional councils were doing in housing, including items such as code enforcement, data retrieval systems, A-95 review, and technical assistance programs.

PB-231 051/4GA PC$10.25/MF$1.45
California Univ., Berkeley. Inst. of Transportation and Traffic Engineering.
COST-EFFECTIVENESS EVALUATION OF FREEWAY DESIGN ALTERNATIVES. FREEWAY OPERATIONS STUDY. PHASE III.
Special rept. Jul 72-Jun 73,
Menahem Eldor, and Adolf D. May. Sep 73, 144p TE-73-2

Descriptors: *Freeways, *Vehicular traffic, *Highway planning, Mathematical models, Cost effectiveness, Evaluation.

A freeway traffic evaluation model has been developed. The input for the model consists of freeway route characteristics and origin-destination demand patterns. The model processes this information through the use of queueing and nonqueueing submodels and results in the calculation of the total passenger time expended for a given traffic demand over a given design freeway. The measure of effectiveness, total passenger time, can be determined from the model for various design alternatives. The annual cost of the design alternatives is determined and combined with the measures of effectiveness to determine the cost effectiveness of each design alternative.

PB-231 064/7GA PC$18.25/MF$1.45
Olson Labs., Inc., Anaheim, Calif.
EFFECTIVENESS OF SHORT EMISSION INSPECTION TESTS IN REDUCING EMISSIONS THROUGH MAINTENANCE,
R. D. Gafford, and T. A. Huls. Jul 73, 303p EPA-460/3-73-009
Contract EPA-68-01-0410

Descriptors: *Air pollution, *Motor vehicle engines, *Exhaust emissions, Monitors, Maintenance, Cost effectiveness, Cost analysis, Hydrocarbons, Nitrogen oxides, Carbon monoxide, Performance, Standards, Carburetors, Methodology.
Identifiers: Idle emission test, Loaded steady state emission test.

This report documents the conduct, methodology, and results obtained from a two-phase study. The objective of an inspection regime would be to detect those malfunctions which are most likely to result in mass emissions to the atmosphere. The 'short cycle' project was initiated to evaluate two methods (loaded and unloaded) of inspection and resulting maintenance. The primary objective was to determine emission reductions, costs, cost effectiveness of the Idle (unloaded) and dynamometer Loaded Steady State (L.S.S.) inspection and maintenance regimes. A secondary objective was to determine how well various short emission inspection test, including Idle and L.S.S., correlated with the 1972 and 1975 CVS Federal Test Procedures. Test procedures and vehicle emission summary tables are appended to the report.

PB-231 085/2GA PC$4.00/MF$1.45
National Field Investigations Center-Cincinnati, Ohio.
RETURN SLUDGE FLOW CONTROL,
Alfred W. West. Sep 73, 16p

Descriptors: *Sludge, *Water flow, *Sewage treatment, Mathematical models, Sedimentation tanks, Fluid flow.

The real value of this control procedure is that is responds to pratically all loading, process balance and sludge quality characteristics to reveal the clarifier sludge flow rate that will best satisfy the net requirement of all these interacting variables. The calculated demand mixed liquor sludge concentrations and quality, sludge solids distribution between the aeration tanks and the final clarifiers, and the waste water flow rates. On a progressive long-term basis it also responds to changes in organic loadings and the interrelated sludge-wasting rates. This control procedure satisfies the dynamic requirements of the total process.

PB-231 123/1GA PC$7.50/MF$1.45
National Field Investigations Center-Cincinnati, Ohio.
PLANT PERFORMANCE AT THE OWENS-CORNING FIBERGLAS CORPORATION. WASTEWATER TREATMENT FACILITY, ANDERSON, SOUTH CAROLINA, MARCH 1973 - MAY 1973.
Dec 73, 88p

Descriptors: *Industrial waste treatment, *Water pollution control Facilities, Sampling, Sludge, Effluents, Performance evaluation, Education, Fiberglass reinforced plastics, Statistical analysis.

Operators were shown how to calculate control adjustment demands from sludge quality and process status tests. They were also taught how to display essential test data and process relationships to permit analysis of process response to control adjustments. Numerous parameters have been calculated, tabularized, and/or plotted to complete the evaluation or plant loadings and process response to control adjustments. This type of evaluation must continue as a part of obtaining 'best effluent'. In addition recommendations have been made to highlight problem areas which were noted during the technical support project. As the project progressed and operator skill was acquired a 'consistency' of final effluent quality was attained. The data also displays the plant's improved ability to withstand the 'shock loads' which were experienced during the project.

PB-231 124/9GA PC$8.75/MF$1.45
National Field Investigations Center-Cincinnati, Ohio.
PLANT PERFORMANCE AT WILLIAMSBURG WASTE TREATMENT PLANT, HAMPTON ROADS SANITATION DISTRICT, WILLIAMSBURG, VIRGINIA, JANUARY 1972-JUNE 1972,
A. W. West, P. E. Chief, and J. B. Walasek. Feb 73, 115p

Descriptors: *Water pollution, *Sewage treatment, Facilities, Virginia, Activated sludge, Aeration, Biochemical oxygen demand, Sediments, Waste treatment, Virginia, Statistical analysis.
Identifiers: Williamsburg(Virginia).

The Williamsburg Waste Treatment Plant is a complete-mix activated sludge plant equipped with surface-mechanical aeration devices. It is designed to treat 9.6 mgd of combined brewery and domestic waste. Only brewery waste was treated during the first three months of operation. Organic and hydraulic loads were low during these months since the incoming flow averaged only mgd. Plant loadings reached normal levels in April with the addition of domestic waste from the City of Williamsburg. The incoming flow averaged approximately 5 mgd for the final three months of the project. Despite many mechanical and operational problems associated with the start-up of the new plant, reductions in BOD5 averaged 97 percent while reductions in suspended solids averaged 92 percent. (Modified author abstract)

UCRL-51459 PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
STUDIES OF POLLUTANT CONCENTRATION FREQUENCY DISTRIBUTIONS.
R. I. Pollack. 2 Oct 73, 96p
Contract W-7405-eng-48

Descriptors: (*Air pollution, *Distribution), Aerosols, Data, Data processing, Diffusion, Mathematical models, Meteorology, Particles, Recording systems, Surface air.

For abstract, see NSA 29 07, number 17971.

13C. Construction Equipment Materials, and Supplies

AD-776 508/4GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
D-906 FINISH GRADER,
Yu. A. Stanik. 6 Nov 73, 6p Rept no. FSTC-HT-23-1881-72
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) n4 p5-6 1971, by Eileen Weppner.

Descriptors: *Earth handling equipment, *Road building equipment, Rollers, Translations, USSR.
Identifiers: *Graders.

The D-906 finish grader, consisting of a long-base machine coupled to a T-50AP tractor with a hydraulic reducing gear, is one of a sequence of road-building machines, and is used to pack bands of stabilized earth 1100 wide alongside which railforms are set up, eliminating the need for guide wires. Technical specifications are listed. The grader is designed on the principle of automatic regulation of the speed of the cutting member depending on the amount of resistance, by means of an automatic throttle built into the delivery line of the hydraulic reducing gear of the tractor.

AD-776 510/0GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ECONOMIC EFFECTIVENESS OF THE DZ-74 SCRAPER,
V. G. Belokrylov, Yu. F. Epifanov, A. V. Leshchinskii, B. A. Katsin, and Yu. N. Sorokin. 6 Dec 73, 9p Rept no. FSTC-HT-23-2521-72
Trans. of Mekhanizatsiya Stroitelstva (USSR) n2 p15-17 1972.

Descriptors: *Earth handling equipment, Scrapers, Excavation, Economics, Translations, USSR.

The economic effectiveness of the new scraper DZ-74 during operation with and without pusher D-661 is evaluated on the basis of the results of official tests. The scraper has been recommended for batch production.

AD-776 553/0GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
KBK-100 UNIT FOR LOGGING,
S. I. Berezov, and Yu. I. Tirman. 25 Jan 74, 5p Rept no. FSTC-HT-23-1880-72
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) n4 p8-9 1971, by Eileen Weppner.

Descriptors: *Road building equipment, Bulldozers, Trenching, Tractors, Chassis, Translations, USSR.
Identifiers: KBK-100 logging units.

The KBK-100 Logging Unit (LK-7 stump puller, LB-18 bulldozer, LK-8 trench digger), replacing the obsolete KBK-2A, is based on the T-100MGP-1 tread-type tractor; the stump puller and trench digger are always on the tractor, one suspended at the rear when the other is in use. Brief technical specificatons are listed. Motion of LK-7 teeth is not interdependent, but depends on resistance encountered by each of the 3 teeth. Quick-release finger-and-pin coupling is used to join the LK-7 chassis to the tractor, the propelling beams of the LB-18 to the tractor, and the chassis of the LK-8 to the tractor, guarding against accidential uncoupling. (Author)

AD-776 554/8GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ETR-253 ROTOR-TYPE TRENCHING EXCAVATOR,
V. V. Pokrovskii, G. I. Sokolov, and I. N. Shpektorov. 6 Nov 73, 5p Rept no. FSTC-HT-23-1882-72
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) n4 p12-14 1971, by Eileen Weppner.

Descriptors: *Earth handling equipment, Excavation, Trenching, Structural members, Transmissions(Mechanics), Drives, USSR, Translations.
Identifiers: ETR-253 excavators.

Comprised of a specially modified DET-250 tractor and a semitrailer excavating unit, the ETR-254 excavator is the first continuous-action machine designed to excavate trenches with a main pipeline diameter of 1420 mm, in soils up to the fifth group inclusive, and also in soils frozen to 1.5 meters.

The trailer chassis is joined to the tractor in a novel way by pins located in the middle part of the treads, ensuring uniform distribution of tread pressure on the ground in both the excavating and the highway position. The new excavator (Industrial Model Certificate 1011, Bulletin of Inventions, 1970, No. 29) has been recommended for mass production.

AD-776 563/9GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
USE OF NOVIKOV GEARING IN CONSTRUCTION AND ROAD BUILDING MACHINERY UNITS,
N. A. Porvatov, and G. F. Panin. 7 Nov 73, 7p
Rept no. FSTC-HT-23-1487-72
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) n8 p18-19 1971.

Descriptors: *Road building equipment, *Gears, Geometry, Transmission gears, Gear teeth, Fabrication, Translations, USSR.
Identifiers: *Involute gears.

AD-776 955/7GA PC$3.25/MF$1.45
Corps of Engineers Omaha Nebr Missouri River Div Lab
DEVELOPMENT OF EQUIPMENT AND TECHNIQUES FOR PNEUMATIC APPLICATION OF PORTLAND CEMENT MORTAR IN SHALLOW PATCHES.
Final rept.,
William R. Coy. Apr 74, 34p Rept nos. MRDL-2-74, MRD-Lab-73/322

Descriptors: *Concrete, *Repair, Applicators, Pneumatic devices, Experimental design, Bonding, Life expectancy.
Identifiers: *Shotcrete, Shotcrete guns, Portland cements.

A practical device for pneumatic application of mortar in shallow patches has been developed. The device is easily assembled from readily available material, has only a few critical dimensions, and can be operated by personnel without extensive training. The patches produced bond well to the existing concrete, and should have excellent durability. The patches can be finished with customary tools and should match existing concrete well enough to provide a pleasing overall appearance.

COM-74-10548/7GA PC$5.25/MF$1.45
National Bureau of Standards, Washington, D.C. Center for Building Technology.
A REVIEW OF NATURAL STONE PRESERVATION.
Preliminary rept.,
Gerald A. Sleater. Dec 73, 41p NBSIR-74-444

Descriptors: *Construction materials, *Rocks, *Preserving, Air pollution, Weathering, Reviews, Degradation, Bibliographies, Cleaning, Biodeterioration, Water, Salts, Coatings, Waxes, Oils, Silicones, Limestone, Sandstones, Marble, Corrosion.
Identifiers: Air pollution effects(Materials).

With increased interest in stone preservation, it is desirable to know what causes stone to decay, and what materials can be used to preserve stone. This review covers the following topics: causes of stone decay, including faults in the stone, salts, natural weathering factors, air pollution, living organisms, and most importantly, water action; various materials that have been used to preserve stone, including paints, waxes, oils, inorganic chemical surface treatments and impregnants, silicones, siliconates, and synthetic organic polymers; methods of evaluating stone preservatives. Field and laboratory procedures for testing stone preservatives, the cleaning of stone, a glossary, and a bibliography are given in appendices. (Modified author abstract)

PATENT-3 264 957 Not available NTIS
Department of the Interior, Washington, D.C.
BINDER AND SURFACE COATING MADE FROM COAL AND ASPHALT.
Patent,
Martin D. Schlesinger, and Raymond W. Hiteshue. Filed 18 Jan 63, patented 9 Aug 66, 5p PAT-APPL-252 534, DOCKET/MIN-483
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bituminous coatings, *Patents, Paving, Asphalts, Bituminous coal, Petroleum products.
Identifiers: PAT-CL-94-9.

According to the process of the invention a mixture of coal and asphalt is heated to a temperature of from about 250 to 450C. for a period of from about 1/2 to about 4 hours. During this digestion the particles of coal are partially dissolved and the balance is stably dispersed throughout the product and a homogenous product is formed. The product has been found to be of particular value as a binder for road building aggregates consisting of mixed sizes of stone or slag.

PATENT-3 341 256 Not available NTIS
Department of the Interior, Washington, D.C.
PROCESS FOR CONVEYING MINERAL SOLIDS THROUGH CONDUITS.
Patent,
Roger L. Adams. Filed 24 May 63, patented 12 Sep 67, 3p PAT-APPL-283 120,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Hydraulic conveyors, *Gels, *Patents, Pipelines, Slurries, Minerals, Lignite, Sodium hydroxide, Calcium oxides.
Identifiers: PAT-CL-302-66.

The patent is concerned with a preparation of thixotropic, high viscosity fluids or gels and their use as a transport media for pipeline conveying of mineral solids.

PB-229 824/8GA PC$4.75/MF$1.45
Syracuse Univ. Research Corp., N.Y.
MICROWAVE HEATING FOR ROAD MAINTENANCE.
Final rept. 1 Sep 72-31 Aug 73,
Richard G. Sawyer, Leo L. Boyko, and George M. Hunt. Aug 73, 133p* SURC-TR-73-436

Descriptors: *Roads, *Concrete, *Maintenance, *Microwave equipment, Bridge decks, Polymers, Heating, Curing, Pavements, Design.
Identifiers: Polymer concretes, Microwave ovens.

The report describes a one year feasibility study to determine the applicability of Microwave power in conjunction with polymers concrete (polymers plus aggregate) for highway maintenance. The specific concern was relative to concrete bridge decks. Work covered in the report includes the defining of polymerization parameters and optimum materials combinations to be rapidly cured in-situ with microwave power. In the portion of the program concerned with microwave equipment, a field unit was designed, built and tested. This unit was used for field testing along with a series of microwave applicators designed and built under the program. With the materials and equipment combined, the research team is able to fill a void in a concrete section and completely cure the patch in less than three minutes.

PB-229 946/9GA PC$3.00/MF$1.45
Bureau of Reclamation, Denver, Colo. Engineering and Research Center.
INITIAL DEVELOPMENT OF POLYMER SHOTCRETE,
R. W. Nichols. Jan 74, 19p* REC-ERC-74-5

Descriptors: *Shotcrete, *Polymers, Formulations, Aggregates, Polymerization, Spraying, Safety.
Identifiers: *Concrete polymer composites.

A limited program was conducted to investigate the potential use of polymer concrete for shotcrete application. Polymer shotcrete is similar to conventional shotcrete except that a polymeric binder is used in lieu of portland cement and water. The polymer shotcrete was successfully applied using modified conventional shotcrete equipment. Polymer shotcrete cures in 10 to 15 minutes after application, develops full compressive strength ranging upwards to 14,600 psi immediately upon curing, and should have potential applications in areas in which these properties would offer definite benefits over conventional shotcrete. Polymer shotcrete, being organic in nature, requires that certain safety measures be taken to assure safe use. (Author)

PB-230 497/0GA PC$7.50/MF$1.45
Illinois State Dept. of Transportation, Springfield. Bureau of Materials and Physical Research.
SKID-RESISTANT CHARACTERISTICS OF EXPERIMENTAL BITUMINOUS SURFACES IN ILLINOIS.
Interim rept. Jul 68-Jul 72,
Philip G. Dierstein, Paul F. Ryan, and Walter C. Purcell. Feb 73, 87p Physical Research-44

Descriptors: *Skid resistance, *Flexible pavements, Surface roughness, Aggregates, Slags, Sands, Tests, Formulations, Illinois.

Skid resistance was among several factors used to evaluate bituminous mixtures, which were placed as experimental surfaces at 17 sites in Illinois. Skid tests indicated that surface texture as represented by changes in macroroughness and microroughness substantially controls the skid resistance of a surface. For the same kind of aggregate, dense-graded mixes that have a 1/2-inch top size aggregate provided higher skid numbers than either sand asphalt or binder course mixes. On the other hand, when aggregate gradation was held constant, air-cooled slag or Synopal, which have excellent microroughness, gave higher skid numbers than limestone or other aggregates that have less microroughness. Moreover, adding rubber to bituminous mixes or substituting stone sand for natural sand in a regular Class I surface course mix produced little, if any change in skid resistance. Bituminous surfaces designed for optimum macroroughness and microroughness should continually give adequate skid numbers regardless of wear, and bituminous mixes that produce a smooth surface texture obviously should be avoided.

PB-230 986/2GA PC$6.00/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
HIGHWAY RESEARCH REPORT: EXPERIMENTAL CATHODIC PROTECTION OF A BRIDGE DECK.
Interim rept.
R. F. Stratfull. Jan 74, 60p CA-DOT-TL-5117-4-74-02

Descriptors: *Highway bridges, *Bridge decks, *Reinforcing steels, *Cathodic protection, Concrete, Maintenance, Epoxy resins, Costs, Corrosion, Deicers.

An electrically conductive asphalt concrete was made by substituting coke breeze for the natural aggregate. By paving a bridge deck with the electrically conductive asphalt concrete, it was found that cathodic protection could be applied to the reinforcing steel. The cathodic protection was measured to be effective when corrosion of steel strips imbedded in concrete containing 10% calcium chloride by weight of the cement was stopped. As an experimental method of repair, two polymers and an epoxy were injected to bond the undersurface fractures. It was observed that the

epoxy could be injected to effect a repair only under certain conditions. It is estimated that the cost of the cathodic protection installation was about $3.00 per square foot of deck ($32/sq.m.). (Modified author abstract)

13D. Containers and Packaging

PB-230 157/0GA PC$3.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
DRAWN AND IRONED CANS: A SELECT BIBLIOGRAPHY,
J. Sloan. Feb 74, 11p* SM/BIB/903

Descriptors: *Cans, *Bibliographies, Steel, Aluminum, Drawing, Tin coatings, Great Britain.

The select bibliography presents 70 references to technical and commercial articles and patent specifications relating to drawn and ironed steel or aluminium cans.

SLA-73-1093 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
HIGH PERFORMANCE ADVANCED COMPOSITE SPHERICAL PRESSURE VESSELS.
F. P. Jr. Gerstle. Dec 73, 36p
Contract AT(29-1)-789

Descriptors: (*Pressure vessels, *Performance), (*Composite materials, Performance), (*Filaments, Performance), (*Resins, Pressure vessels), Epoxides, Failures, Graphite, Matrix materials.

For abstract, see NSA 29 07, number 18014.

13E. Couplings, Fittings, Fasteners, and Joints

AD-776 742/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EFFICIENCY OF FILM COOLING ON CERTAIN GAS TURBINE STATOR SURFACES,
V. A. Zysin, and M. S. Zolotogorov. 8 Mar 74, 12p Rept no. FTD-HT-23-776-74
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Energetika (USSR) v14 n5 p48-53 May 71, by Marilyn Olaechea.

Descriptors: *Gas turbines, *Turbine stators, *Film cooling, Air cooled, Thermal radiation, Injection, Experimental data, USSR, Translations.

N74-17612/4GA PC$5.75/MF$1.45
Danish Research Center for Applied Electronics, Hoersholm.
MECHANICAL JOINT METHOD: STUDIES OF RESISTANCE TIGHTENING BY VIBRATION, INCLUDES 13 VARIATIONS OF BL.A.3 MM RIVET- AND SCREW CONNECTIONS MEKANISKE SAMLEMETODER: UNDERSOEGELSE AF MODSTANDSDYGTIGHED MOD VIBRATION. OMFATTER 13 VARIANTER AF BL.A.3 MM NITTE-OG LASEDE SKRUEFORBINDELSER.
B. E. Bang. Oct 73, 51p ECR-36
In Danish; English Summary.

Descriptors: *Fasteners, *Joints (Junctions), *Mechanical devices, *Vibration effects, Environmental tests, Mechanical properties, Performance tests, Stress analysis.

For abstract, see STAR 1208

PAT-APPL-343 315 PC$4.00/MF$1.45
Department of the Air Force Washington D C
MECHANICAL DOOR INTERLOCK SYSTEM.
Patent Application,
Filed 21 Mar 73, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Locking(Mechanics), Patents, Doors, Interactions, Mechanical components, Control systems.
Identifiers: *Patent applications, PAT-CL-70-91.

The patent application describes a mechanical door interlock system having a mechanical locking section used to prevent the opening of one door to a chamber or the like if an opposing door is not closed. The opening motion of one door allows a cam plate, under tension, to rotate and move a connecting rod. The motion of this rod prevents the rotation of the locking section of the other door, with the effect of locking this door.

AD-164 492/1GA PC$4.00/MF$1.45
Department of the Air Force Washington D C
V-BAND COUPLING.
Patent application,
W. H. Kune. Filed 28 Aug 73, 9p Rept no. PAT-APPL-392 386
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Couplings, Patents, Tubes, Pipes, Joining, Locking mechanisms, Bolts.
Identifiers: *Patent applications, PAT-CL-285-129.

The patent application describes a V-band coupling for joining the abutting ends of tubular sections having a plurality of retainer elements surrounding the ends of the tubular sections. A continuous band clamping element is used to force the retainer elements into engagement with the tubular sections. In order to fixedly secure this clamping element in place a locking member is used which incorporates therein a pair of cylindrically shaped saddle blocks and a bolt having a head with a flat undersurface. With the abovementioned elements a V-band coupling with increased fatigue life is produced.

UCID-16401 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
FATIGUE OF WELDED 5083 ALUMINUM ALLOY.
J. E. Hanafee. 19 Dec 73, 9p
Contract W-7405-eng-48

Descriptors: (*Aluminium base alloys, *Failures), (*Welded joints, Failures), Electron beam welding, Fatigue.

For abstract, see NSA 29 07, number 18015.

13F. Ground Transportation Equipment

AD-776 574/6GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
GAS FURNACE AIR PRE-HEATER DEVICE FOR 100 AUTOMOBILES,
V. Komarov. 5 Dec 73, 4p Rept no. FSTC-HT-23-2394-72
Trans. of Avtomobilnyi Transport (USSR) n12 p25 Dec 71.

Descriptors: *Automotive vehicles, *Vehicle heaters, Gas heating, Furnaces, Ducts, Ventilators, Translations, USSR.
Identifiers: *Preheaters.

The device for heating automobiles by means of natural gas consists of a gas furnace, plenum with exhaust pipe, plenum-to-ventilator air duct, two VD-11 ventilators with 20-kilowatt motors, and two main air lines with branch outlets. At an outdoor air temperature of -25 degrees or below, it takes five hours to heat the diesel motor of a 'Tatra' auto; cost of the device is 7400 rubles and break-even time is 3.6 months. The device is reliable, low-cost, and simple enough in construction to be built at an auto-transport plant.

AD-776 894/8GA PC$10.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONCISE AUTOMOTIVE HANDBOOK (6TH EDITION REVISED AND EXPANDED).
4 Feb 74, 565p Rept no. FTD-HT-23-504-74
Edited trans. of mono. Kratkii Avtomobilnyi Spravochnik (6th Edition Revised and Expanded), n.p., 1972 p1-512, by John A. Miller.

Descriptors: *Automotive industry, *Automotive vehicles, *Handbooks, Passenger vehicles, Trucks, Tractors, Trailers, USSR, Translations.

Automotive transportation in the Soviet Union is continually being supplemented with new, improved models of rolling stock. In recent years, all plants of the automotive industry have turned to the production of new or modernized models of rolling stock having higher technical and operating qualities. The number of models is continually increasing in accordance with the operational requirements. The handbook contains necessary information on the basic parameters of rolling stock presently in operation, the nomenclature and quality of operational materials, tires and electrical instruments, and also certain other information which can prove to be useful for workers in the field of automotive transportation.

N74-17683/5GA PC$4.00/MF$1.45
Krauss-Maffei A.G., Munich (West Germany).
TRANSRAPID: APPLICATIONS OF INTEGRATED ELECTROMAGNETIC SUSPENSION TECHNIQUE TRANSRAPID: ANWENDUNG INTEGRIERTER ELEKTROMAGNET-SCHWEBETECHNIK.
H. Vonbernuth. 1973, 14p DGLR-PAPER-73-156
Conf-Presented at the Dglr Symp. Moeglichkeiten Eines Spurgebundenen Hochgeschwindigkeitsverkehrs, Bonn, 6 Nov. 1973.
Language in German.

Descriptors: *Electromagnets, *Electronic control, *Magnetic suspension, *Rail transportation, *Rapid transit systems, Electrodynamics.

For abstract, see STAR 1208

N74-17684/3GA PC$4.00/MF$1.45
Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Zentralbereich Entwicklungen.
ELECTROMAGNETIC SUSPENSION TECHNIQUE WITH SEPARATED SUPPORT AND GUIDANCE SYSTEMS ELEKTROMAGNET-SCHWEBETECHNIK MIT GETRENNTEN TRAG- UND FUEHRUNGSSYSTEMEN.
H. Fabian. 1973, 9p DGLR-PAPER-73-157
Conf-Presented at the Dglr Symp. Moeglichkeiten Eines Spurgebundenen Hochgeschwindigkeitsverkehrs, Bonn, 6 Nov. 1973.
Language in German.

Descriptors: *Electromagnets, *Electronic control, *Magnetic suspension, *Rail transportation, *Rapid transit systems, Electrodynamics, Supports.

For abstract, see STAR 1208

PB-229 893/3GA PC$4.75/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
LITERATURE SURVEY OF TIRE-ROAD EXPERIMENTS,
James F. Sinnamon. Feb 74, 144p* UM-HSRI-PF-74-5

Descriptors: *Tires, *Traction, *Reviews, Road tests, Tire treads, Automobile tires, Test equipment.
Identifiers: *Vehicle hydroplaning, Aircraft tires.

The literature survey is restricted to publications which report the results of tests performed with real tires on actual road surfaces. The objective of the survey was to identify and summarize a compact source of reference material believed to contain most of the current knowledge derived from on-the-road testing of automobile and aircraft tires. To this end, 38 references are individually summarized in a standard format outlining goal of tests, equipment used, road surfaces, tires tested, test procedure, techniques for analyzing and presenting data, and conclusions. A summary of the survey is presented.

PB-229 991/5GA PC$7.25/MF$1.45
Southwest Research Inst., San Antonio, Tex.
ASSESSMENT OF CONTROL TECHNIQUES FOR REDUCING EMISSIONS FOR LOCOMOTIVE ENGINES.
Final rept. Sep 72-Jun 73,
J. O. Storment, and K. J. Springer. Nov 73, 316p
DOT-TSC-FRA-73-9, FRA-ORD/D-74-21

Descriptors: *Locomotives, *Diesel engines, *Air pollution, Exhaust gases, Nitrogen oxides, Fuel injectors, Time measurement, Air pollution control.

The primary objective of this study was to determine the most effective method of reducing emissions of oxides of nitrogen from a two-cylinder version of an EMD series 567C locomotive engine. The control method judged most effective was that which resulted in the greatest reduction in NOx, had the least adverse effects on other emission constituents and engine operation, yet was simple to install and maintain. Results of these tests indicated that the most effective control method was retarded injection timing (4 degrees from standard). The next most effective method was EGR, with the recirculated exhaust cooled to 125-150F. It was necessary to derate (or reduce) engine power at certain points to maintain smoke opacity at acceptable levels with all of these control techniques. (Modified author abstract)

PB-230 007/7GA PC$4.50/MF$1.45
Federal Railroad Administration, Washington, D.C. Office of Research, Development and Demonstrations.
PUBLISHED RESEARCH REPORTS - FEDERAL RAILROAD ADMINISTRATION.
Bibliography 1966-Oct 73.
Oct 73, 103p* FRA-ORD/D-74-23
Prepared by National Technical Information Service, Springfield, Va. Supersedes PB-213 047.

Descriptors: *Railroads, *Rapid transit railways, *Bibliographies, Abstracts, Research projects, Documentation.
Identifiers: *High speed ground transportation, Public transportation.

The bibliography presents and abstracts major research reports published by the Office of Research, Development and Demonstrations(ORD and D) in the Federal Railroad Administration, U.S. Department of Transportation. Also included are selected reports of other Department of Transportation agencies that relate to ORD and D activities. These reports represent results of contracted research, development, demonstrations, systems engineering, technology assessment, transportation surveys, and mathematical model developments, along with intramural research reports and program and project summaries. The abstracts are arranged according to technical categories under Rail Technology and Advanced Systems. (Author)

PB-230 371/7GA PC$7.50/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
AN EVALUATION OF THE MICHIGAN TRIAL SUBSTITUTE MOTOR VEHICLE INSPECTION PROGRAM.
Final rept. 1 May 72-31 Dec 73,
Jay S. Creswell, Jr. Jan 74, 336p UM-HSRI-SA-74-1

Descriptors: *Motor vehicles, *Inspection, Michigan, Evaluation, Traffic surveys, Performance tests, Randomization, Sampling, Motor vehicle operators, Interviews, Police.
Identifiers: Motor vehicle inspection.

The report examines the effectiveness of an on-road, spot check method of conducting vehicle inspections. The study concentrated on an enhanced program which was operated in three Michigan counties. The proportion of the vehicle population inspected was systematically varied across counties with 5%, 10%, and 20% levels being used. Independent measurements were collected on vehicle condition, through a random sample of 6,000 vehicles, which were given a full inspection. An additional 43,000 vehicles were observed for lighting system outages, and 5,500 drivers were interviewed. For a six month observation period, a modest reduction in vehicle defects, between 5% and 10%, was obtained in the area with the heaviest concentration of inspection activity. Driver interviews showed no decrease in public acceptance of the program with increased police effort. Follow-up procedures were found to be quite effective in obtaining the repair of defective vehicles.

PB-230 394/0GA PC$4.00/MF$1.45
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, BRIDGE NO. K-4052, SECTION K005, VIENNA ROUTE.
25 Mar 74, 13p MRWJ-74-103

Descriptors: *Subway railways, *District of Columbia, *Routes, *Subsurface investigations, Foundations, Rock mechanics, Soil mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning, Bridges.
Identifiers: Foundation engineering, *Vienna route, Design section K005.

Results are summarized of two borings made to investigate conditions at the location of Bridge No. K-4052 over Bon Air Creek in Bon Air Park in Section K005 of Vienna Route of the Washington Metropolitan Area Metro system. The report contains a geological section along the axis of the bridge which shows the position of these borings, logs of the borings and a brief text summarizing anticipated design and construction problems.

PB-230 451/7GA PC$5.75/MF$1.45
Calspan Corp., Buffalo, N.Y.
INVESTIGATION OF NEW CONCEPTS OF AIR BAG RESTRAINT SYSTEMS FOR FRONT SEAT PASSENGERS.
Final rept. Feb 72-Oct 73,
David J. Biss, and Norris E. Shoemaker. Oct 73,
221p CALSPAN-ZM-5115-V-1 DOT-HS-801 039
Contract DOT-HS-053-2-280

Descriptors: *Safety devices, *Automobiles, Accident prevention, Impact shock, Insulation, Impact tests, Inflatable structures.
Identifiers: *Air bag restraint systems, *Occupant protection.

The research program was to design and demonstrate an advanced inflatable restraint system which would provide improved protection for the right front seat occupant during frontal and oblique frontal collisions at impact velocities up to 50 MPH. The research results are summarized for two concepts which were investigated under this program: the multicell and the air bag/collapsible panel combination. The second phase of this program was redirected toward designing and demonstrating the air bag/collapsible dash (ABCD) concept. (Modified author abstract)

PB-230 485/5GA PC$5.75/MF$1.45
Mitre Corp., McLean, Va.
THE TRACKED RAM AIR CUSHION VEHICLE (TRACV). A SYSTEM DEFINITION STUDY.
Technical rept. Nov 72-Nov 73,
W. E. Fraize, and T. M. Barrows. Nov 73, 224p*
MTR-6554-Rev-1 FRA-ORD/D-74-27
Contract DOT-FR-30015

Descriptors: *Tracked air cushion vehicles, *Aerodynamic configurations, *Lift, Substitutes, Experimental design, Velocity, Concepts, Ground effect, Feasibility, Passenger transportation, Propeller fans, Thrust, Electric propulsion, Induction motors.
Identifiers: *Ram wing levitation, *High speed ground transportation.

Recent progress in the study of aerodynamic levitation for high speed ground transportation vehicles (the so-called 'ram wing') has led to the concept of a Tracked Ram Air Cushion Vehicle (TRACV). In this study, the TRACV concept is viewed as an air-supported alternative to the tracked air cushion vehicle, and is seen to be a viable tracked levitated vehicle (TLV) system candidate that offers potential advantages of technical simplicity. The basic principles of dynamic air cushion levitation and guidance and the features of system components are described. Fluid and electromagnetically propelled vehicles are evaluated in terms of a system with 100 passenger vehicles with a 300 mph cruise capability, with emphasis given to the technically more attractive fluid propulsion system. Areas requiring further analysis and development are discussed.

PB-230 689/2GA PC$5.50/MF$1.45
Wisconsin Univ., Milwaukee. Dept. of Systems-Design.
QUANTIFICATION OF COMFORT AND CONVENIENCE FACTORS FOR BEHAVIORAL MODE-CHOICE MODELS.
Theron D. Aslaksen. May 73, 196p* UMTA-WI-11-0003-73-3
Contract DOT-UT-254

Descriptors: *Transportation, *Urban planning, *Human behavior, Questionnaires, Statistical analysis, Decision making, Comfort, Quantitative analysis, Qualitative analysis.
Identifiers: Convenience.

One of the prime obstacles to development of behavioral models of mode-choice is definition of relevant parameters for models. Two problems met with use of comfort and convenience factors: definition of these qualitative variables in quantitative terms; and whether to use real, measured values of the variables, or users' perceptions of variables in the behavioral models. In this study the comfort and convenience factors were defined by sets of modal attributes based on previous research. A self-administered, mail-back questionnaire was developed to gather data to test the factor definitions in a recently developed behavioral mode-split model and to examine relationships between traveler's attitudes toward modes, their perceptions of modal attributes and actual travel behavior. Analysis of the relationships indicated a need to account for traveler's attitudes in models attempting to simulate actual mode-choice behavior. (Modified author abstract)

PB-230 739/5GA PC$6.25/MF$1.45
Chicago Transit Authority, Ill.
NORTHWEST PASSAGE DEMONSTRATION PROJECT.
May 73, 65p UMTA-IL-06-0009-73-1
Prepared in cooperation with Chicago and North Western Railroad.

Descriptors: *Rapid transit railways, *Passenger terminals, *Urban transportation, Illinois, Surveys, Railroads, Urban areas, Market research.
Identifiers: Commuter rail systems, Chicago(Illinois).

The Northwest Passage was designed to provide a convenient pedestrian interchange between a com-

muter railroad and a rapid transit line in the Chicago area. A modern weather-protected connecting passageway between C and NW's suburban concourse in the main passenger terminal and the mezzanine level of the Clinton-Lake station on CTA's Lake-Dan Ryan rapid transit route was constructed. The Clinton-Lake transit station was rehabilitated. Objectives of study were to: (1) Determine effect of rider use of Passage on C and NW, CTA's rapid transit line and other transportation modes; (2) ascertain characteristics of riders gained or lost and reasons for use of each particular mode, etc.

PB-230 740/3GA PC$6.25/MF$1.45
Cranfield Inst. of Tech (England). Centre for Transport Studies.
DIAL-A-RIDE IN MAIDSTONE,
Roger Slevin, and Sandy Ochojna. Aug 73, 65p Cranfield-CTS-6

Descriptors: *Urban transportation, Automobiles, Telephone systems, Surveys, Great Britian.
Identifiers: *Dial a ride systems.

The study is the first evaluation of a dial-a-ride operation in Britain. A many-to-two dial-a-ride service has been in operation in Maidstone since August 1972. The report assesses the degree to which the scheme has achieved the goals of operational viability, social equity and consumer satisfaction. None appeared to be satisfied, but much useful data on operational procedures and passenger requirements were forthcoming which should ensure better results in trials to be held elsewhere.

PB-230 892/2GA PC$4.50/MF$1.45
Transportation Systems Center, Cambridge, Mass.
EXHAUST-SYSTEM LEAK TEST: QUANTITATIVE PROCEDURE.
Final rept. Jul 70-Jun 72,
Earl C. Klaubert. Jan 74, 108p DOT-TSC-NHTSA-72-10 DOT-HS-801 037

Descriptors: *Automobiles, *Exhaust systems, Leakage, Inspection, Test methods, Flow measurement, Safety engineering, Flowmeters.

A quantitative, periodic motor vehicle safety-inspection test for determining the leakage rate of engine exhaust from an automotive exhaust system was investigated. Two technical approaches were evaluated, and the better one was selected for development of necessary special equipment and test procedures. The results of the measurement are expressed as the diameter of a single round hole, equivalent in leakage rate to the sum of all leaks in the exhaust system being tested. This method is capable of measuring leaks equivalent in size down to about a 1/16-inch hole; discrimination between leaks of 1/8- to 1/2-inch diameter is reliable and easily achieved. Total time to conduct a test and evaluate results is estimated to be from two to five minutes.

PB-230 902/9GA PC$6.50/MF$1.45
Agbabian Associates, El Segundo, Calif.
SUBCOMPACT VEHICLE TESTS WITH INFLATABLE RESTRAINTS. VOLUME II. TECHNICAL REPORT.
Final rept. Jun 71-Aug 73,
J. S. McKibben, B. Barclay, and L. E. Carlson. Dec 73, 273p AA-R-7213-3016-Vol-2 DOT-HS-801 004
Contract DOT-HS-066-1-185
See also PB-226 231, and PB-230 903.

Descriptors: *Safety devices, *Crash tests, *Automobiles, Human factors engineering, Barriers, Impact tests, Safety belts.
Identifiers: *Air bag restraint systems.

A test project was conducted to gather information on the performance potential of inflatable occupant restraint systems (IORS) in subcompact sedans in full scale vehicle crash conditions. Twelve barrier impact tests were performed with 1972 Ford Pinto vehicles, two of these tests using lap/shoulder belt restraint systems for dummies and the remaining ten using two different types of IORS. Data were compared to FMVSS 208 requirements, evaluated for repeatability, and analyzed for occupant injury potential. Acquired on each test were electronic data for vehicle and dummy responses, normal (sound-speed) and high-speed movie coverage, and 35 mm black-and-white photographs and slides.

PB-230 903/7GA PC$4.75/MF$1.45
Agbabian Associated, El Segundo, Calif.
SUBCOMPACT VEHICLE TESTS WITH INFLATABLE RESTRAINTS. VOLUME II. APPENDIX D. PART 1. BASELINE TESTS.
Final rept. Jun 71-Aug 73,
J. S. McKibben, B Barclay, and L. E. Carlson. Dec 73, 137p AA-R-7213-3016-Vol-2-App-D-Pt-1 DOT-HS-801 005
Contract DOT-HS-066-1-185
See also PB-226 231, PB-230 904, and PB-230 905.

Descriptors: *Safety devices, *Crash tests, *Automobiles, Impact tests, Safety belts, Data processing.
Identifiers: *Air bag restraint systems.

The document contains data traces recorded on the oscillograph.

PB-230 904/5GA PC$10.25/MF$1.45
Agbabian Associates, El Segundo, Calif.
SUBCOMPACT VEHICLE TESTS WITH INFLATABLE RESTRAINTS. VOLUME II. APPENDIX D. PART 2. OLIN SYSTEM TESTS.
Final rept. Jun 71-Aug 73,
J. S. McKibben, B. Barclay, and L. S. Carlson. Jan 74, 438p AA-R-7213-3016-Vol-2-App-D-Pt-2 DOT-HS-801 006
Contract DOT-HS-066-1-185
See also PB-230 903, PB-230 905, and PB-226 231.

Descriptors: *Safety devices, *Crash tests, *Automobiles, Impact tests, Safety belts, Data processing.
Identifiers: Air bag restraint systems.

The document contains data traces recorded on the oscillograph.

PB-230 905/2GA PC$9.25/MF$1.45
Agbabian Associates, El Segundo, Calif.
SUBCOMPACT VEHICLE TESTS WITH INFLATABLE RESTRAINTS. VOLUME II. APPENDIX D. PART 3. ROCKET RESEARSH SYSTEM TESTS.
Final rept. Jun 71-Aug 73,
J. S. McKibben, B. Barclay, and L. E. Carlson. Jan 74, 457p AA-R-7213-3016-Vol-2-App-D-Pt-3 DOT-HS-801 007
Contract DOT-HS-066-1-185
See also PB-226 231, and PB-230 904.

Descriptors: *Safety devices, *Crash tests, *Automobiles, Impact tests, Safety belts, Data processing.
Identifiers: *Air bag restraint systems.

The document contains oscillograph trace data.

PB-230 947/4GA PC$3.25/MF$1.45
Dynamic Science, Phoenix, Ariz.
SUMMARY OF FORD EXPERIMENTAL SAFETY VEHICLE TESTS.
Final rept. Jan-Jun 73.
Feb 74, 32p 2310-73-119 DOT-HS-801 026
Contract DOT-HS-046-2-468

Descriptors: *Automobiles, *Crash tests, Design standards, Accident prevention, Performance evaluation, Impact tests, Safety engineering, Nondestructive tests.
Identifiers: *Safety cars.

The report summarizes the results of testing two Ford Experimental Safety Vehicles (ESV's). The purpose of the test program was to conduct quantitative nondestructive and crash tests on the ESV's to determine their compliance with the Government performance specifications. The overall evaluation of the Ford Experimental Safety Vehicles involved the following four tasks: Evaluation of design requirements; accident avoidance evaluations; crash injury reduction evaluations; and post-crash factors evaluations.

PB-230 964/9GA PC$8.00/MF$1.45
Transportation Systems Center, Cambridge, Mass.
DEVELOPMENT AND EVALUATION OF ANTICIPATORY CRASH SENSORS FOR AUTOMOBILES.
Final rept. Jun 70-Jun 73,
J. Hopkins, F. R. Holmstrom, M. Hazel, and R. Abbott. Feb 74, 335p DOT-TSC-NHTSA-73-6 DOT-HS-801 036

Descriptors: *Automobiles, *Crash locator beacons, *Radar equipment, Collision avoidance, Accident prevention, Safety devices, Actuators, Collision research.
Identifiers: *Air bag restraint systems, *Automobile crash sensors.

The report discusses the means, effectiveness, and estimated costs of carrying out anticipatory sensing of automobile collisions. Actuation of passive restraint systems requires only a small advance warning to extend the protection of such devices to impact speeds of 30 to 60 MPH -- a range encompassing a large number of fatal and severe-injury accidents. Radar is the most promising crash sensing technique. Design, construction, and extensive test of prototype systems, accompanied by studies of component cost and reliability, show that an OEM price of $20 per unit should be attainable for systems exhibiting high electronic reliability.

PB-231 049/8GA PC$4.00/MF$1.45
Transportation Systems Center, Cambridge, Mass.
FREIGHT TRANSPORTATION INFORMATION SYSTEMS AND THEIR IMPLICATIONS FOR R AND D POLICY.
Final rept. Jan-Oct 72,
Kenneth F. Troup, III. Mar 74, 86p DOT-TSC-OST-73-10

Descriptors: *Cargo transportation, *Management systems, *Information systems, Urban areas, Rail transportation, Highway transportation, Waterway transportation, Air transportation, Data processing.
Identifiers: Intermodal cargo transportation, Management information systems.

The current use of computerized management information and control systems in intercity freight transportation is examined. Each of the four modes (railroad, motor carrier, maritime and air cargo industries) is investigated. In each case, computer information systems can help improve the operational efficiency of the mode and provide management (and regulators) with more accurate data for decision making. The intermodal data standard and exchange problem is also discussed. Appropriate recommendations for DOT research and development policy are made. These include development of a national railroad management system, development of terminal control systems for railroad yards and intermodal terminals, support to development of a maritime industry information system and increased effort in the area of data facilitation.

13G. Hydraulic and Pneumatic Equipment

AD-776 549/8GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
SOME FEATURES OF SPRINGLESS OSCILLATING COMPRESSORS (NEKOTORYE OSOBENNOSTI BESPRUZHINNYKH KOLEBATELNYKH KOMPRESSOROV),
A. L. Glikson, and I. M. Shnaid. 1 Aug 72, 8p Rept no. FSTC-HT-23-2151-72
Trans. from Kholodilnaya Tekhnika i Tekhnologiya (USSR) p63-69 1970.

Descriptors: *Compressors, Mathematical models, Drives, Electrical equipment, Oscillation, Refrigerant compressors, Translations, USSR.

Design criteria for springless oscillating compressors are analytically derived on the basis of a simple mathematical model. The possibility of the existance of stationary oscillations in the mobile compressors with oscillating electric drive is also analyzed.

AD-776 957/3GA PC$3.00/MF$1.45
Harry Diamond Labs Washington D C
ELECTRO-FLUIDIC TRANSDUCTION USING SMALL HEATING COILS IN CAPILLARY PASSAGES,
Silas Katz, and Elmer Swartz. Dec 73, 18p Rept no. HDL-TM-73-31

Descriptors: *Transducers, *Fluidics, Circuits, Electrical resistance, Electric bridges, Viscosity, Flueric devices, Transfer functions.
Identifiers: *Electrofluidic transducers.

A new type of electro-fluidic transducer is evaluated, which uses the heat dissipation from an electric coil in a capillary passage to change the viscosity of the fluid passing through the passage. A transfer function for the transducer is developed crudely, and static measurements on two different sized models show good agreement with calculations. The capillary electro-fluidic transducer has high static sensitivity but low bandwidth. Electrical powers of less than 0.100 W may be converted to sizeable fluid signals; however, the bandwidth of the transducers tested was only about 1.0 Hz. (Author)

AD-777 013/4GA PC$3.75/MF$1.45
Mcdonnell Douglas Astronautics Co Titusville Fla
CLASSIFICATION OF FLUIDIC POWER SUPPLIES.
Final rept.,
W. J. Westerman, Jr., and G. W. Roe. 21 Dec 73, 67p Rept no. L0244
Contract DAAG39-73-C-0172

Descriptors: *Fluidics, *Pneumatic devices, Classification, Power supplies, Cold gases, Hot gases, Flueric devices, Particulates, Sampling.

The report documents the results of a program to derive a classification system for military fluidic power supplies on the basis of solid and liquid contaminants present in the gas. Both cold gas power supplies and hot gas power supplies were sampled. Sampling procedures were developed to take particulate, gravimetric and humidity samples of each power supply source. Sample results are presented in tabular form listing solid content, particle size spectra, oil content, and water content. A proposed Classification of Military Pneumatic Power Supplies is offered. (Modified author abstract)

AD-777 027/6GA PC$6.00/MF$1.45
Naval Postgraduate School Monterey Calif
REPORT ON THE TESTING OF A HYBRID (RADIAL-TO-AXIAL) COMPRESSOR.
Final rept. to Jul 73,
Raymond P. Shreeve. Nov 73, 232p Rept no. NPS-57SF73112A

Descriptors: *Turbomachinery, *Mixed flow compressors, *Hybrid systems, Axial flow, Radial flow, Compressor parts, Diffusers, Flow fields, Computer programs.

A full account is given of a test program to evaluate a prototype hybrid compressor, wherein the flow is turned through 180 degrees (from axial to radial to axial) within the rotor. The initial stator, or diffuser, consisted of two cascades of unswept and untwisted blades arranged and designed as in an axial compressor. The performance was measured with two diffusers of different solidities and with changes in the blade stagger angles. The maximum efficiency approached 80%; however, the flow was separated in the second blade row for all diffuser designs tested. Surveys from hub to tip at the rotor exit revealed an unusually large variation in flow angle. Approximations were obtained from normalized distributions of velocity and angle from all tests which will allow the design of a diffuser with swept or twisted blades. (Modified author abstract)

13H. Industrial Processes

AD-776 578/7GA PC$3.75/MF$1.45
Naval Ordnance Station Louisville Ky
THERMO AND PLASMA FLAME SPRAY PROCESSES.
Final rept.
Oct 73, 58p Rept no. NOSL-MT-016

Descriptors: *Flame spraying, Repair, Ordnance, Metallizing, Plasmas(Physics).

The report presents a brief description of the wire, thermo and plasma spray processes and their respective applicabilities in the repair of Naval ordnance Station, Louisville, for using thermo and plasma spray processes and the equipment and facilities installed. Included is information pertaining to familiarization of personnel with the processes, safety and environmental protection, product quality and cost savings, together with examples of procedures and standards adopted to ensure responsible control. (Modified author abstract)

AD-776 794/0GA PC$3.25/MF$1.45
Lehigh Univ Bethlehem Pa Dept of Metallurgy and Materials Science
LIMIT ANALYSIS OF FLOW THROUGH CONICAL CONVERGING DIES.
Final rept. Feb 72-Aug 73,
Betzalel Avitzur, Walter C. Hahn, Jr., and Samy Iscovici. Oct 73, 46p AFML-TR-73-259
Contract F33615-72-C-1153

Descriptors: *Material forming, Flow, Dies, Extrusion, Drawing(Forming), Mathematical analysis, Metals, Velocity.

Both upper and lower bound mathematical solutions are presented for axisymmetric flow through conical converging dies. For the upper bound solution, triangular velocity fields have been solved and compared to previously published work on spherical velocity fields. It is found that each type provides a lower solution over a part of the range of process variables. A previously published lower bound solution for axisymmetric flow is refined. (Author)

AD-776 942/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
GOOD LUCK (IN THE SOVIET UNION A UNIFIED SYSTEM FOR THE TECHNOLOGICAL PLANNING OF PRODUCTION IS BEING DEVELOPED),
V. Belyaev. 25 Mar 74, 9p Rept no. FTD-HT-23-1247-74
Edited trans. of Pravda Vostoka (USSR) n73 p3, 28 Mar 73, by Charles T. Ostertag, Jr.

Descriptors: *Production, Standards, Planning, Production engineering, USSR, Translations.

JPRS-61321 PC$5.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
PLASMA PROCESSES IN METALLURGY,
B. E. Paton. 26 Feb 74, 194p
Trans. of mono. Plazmennye Protsessy v Metallurgii i Tekhnologii Neorganicheskikh Materialov, Moscow, 1973 243p.

Descriptors: *Plasma spraying, *Arc melting, *Arc spraying, *Arc cutting, Plasma jets, Plasma spraying, Plasmas(Physics), Refractories, Translations, USSR.

The report contains an examination of the state and development of the theory of generation and application of low temperature plasma including plasma-arc heating.

N74-17195/0GA PC$8.50/MF$1.45
General Technologies Corp., Springfield, Va.
DEVELOPMENT OF IMPROVED ELECTROFORMING TECHNIQUE.
L. C. Mccandles, and L. G. Davies. 1 Nov 73, 108p NASA-CR-134480, GTC-297
Contract NAS3-15828

Descriptors: *Electroforming, *Regenerative cooling, *Thrust chambers, Electrodeposition, Nickel, Tensile tests.

For abstract, see STAR 1208

N74-17198/4GA PC$5.25/MF$1.45
Cranfield Inst. of Technology (England).
THE PEG SYSTEM OF PRODUCTION CONTROL USING A VISIBLE RECORD COMPUTER.
P. E. Galgut. Oct 73, 45p CRANFIELD-M/P-4

Descriptors: *Computer techniques, *Industrial management, *Production engineering, *Production management, Data processing equipment, Data systems, Information retrieval.

For abstract, see STAR 1208

PATENT-2 825 641 Not available NTIS
Department of the Interior, Washington, D.C.
METHOD FOR MELTING REFRACTORY METALS FOR CASTING PURPOSES.
Patent,
Robert A. Beall, John O. Borg, and Henry L. Gilbert. Filed 21 Sep 55, patented 4 Mar 58, 5p PAT-APPL-535 765,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Refractory metals, *Melting, *Patents, Casting, Arc melting, Consumable electrode process.
Identifiers: PAT-CL-75-10.

The patent relates to the melting of refractory metals and is more particularly directed to a method for accumulating a sufficient quantity of the molten metal to permit the casting of useful shapes therefrom.

PATENT-2 892 924 Not available NTIS
Department of the Interior, Washington, D.C.
ELECTRODE FOR MELTING AND ARC WELDING ZIRCONIUM METAL.
Patent,
Floyd W. Wood. Filed 24 Jan 57, patented 30 Jun 59, 3p PAT-APPL-636 213,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Welding electrodes, *Patents, Arc welding, Zirconium, Melting, Zirconium nitrides.
Identifiers: Nonconsumable electrodes, PAT-CL-219-118.

The patent relates to non-consumable electrodes for arc welding and melting zirconium. It provides an improved arc welding electrode, and a method employing it for arc welding. The arc welding electrode has a stem of zirconium, with a tip comprising zirconium nitride and zirconium metal.

PATENT-3 794 574 Not available NTIS
Department of the Interior, Washington, D.C.
DEVICE FOR CATHODICALLY PROTECTING METAL CONDUIT SYSTEM.
Patent,
Donald A. Fauth, and Ramon T. Lindberg. Filed 27 Apr 72, patented 26 Feb 74, 4p PAT-APPL-247 988, DOCKET/SAL-2037
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cathodic protection, *Patents, Pipes(Tubes), Electrolytes, Salt water.
Identifiers: PAT-CL-204-197.

The patent relates to a metal conduit system particularly adapted to flow an electrolyte therethrough. It is provided with a sacrificial anode having an inside tubular surface adapted to receive the electrolyte against substantially its entire area. Such anode serves as a containment member for the electrolyte.

PB-230 107/5GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
DETERMINATION OF 'R' VALUES BY A WEIGHING TECHNIQUE,
M. P. Sidey. Feb 74, 5p SM/TN/A/1145

Descriptors: *Deep drawing, Deformation, Determination, Weight measurement, Great Britain.

At the recent International Deep Drawing Research Group meeting in Zurich, an Italian contribution suggested that 'r' values could be determined from the weight changes between constant diameter blanks taken from unstrained and strained materials. Theoretical calculations have been made of the expected weight changes for given length strains and 'r' values. It is concluded that the weight changes of 30 mm blanks taken from sheet gauges (i.e. 0.25 mm to 1 mm) of mild steel are well within the capabilities of a conventional analytical balance. In principle, 'r' values can be measured to an accuracy of at least 0.1 in 'r' by this method. In the course of these calculations it became apparent that an accurate knowledge of the length strain was necessary for the determination of accurate 'r' values. Experimental work is required to determine whether or not the technique is suitable in practice.

13I. Machinery and Tools

AD-776 795/7GA PC$5.00/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
INVESTIGATION OF THE FEASIBILITY OF FABRICATING BIMETALLIC COEXTRUDED GEARS.
Final rept. 1 Jun 72-31 Aug 73,
K. M. Johansen. Dec 73, 153p* Rept no. 73-210355 AFAPL-TR-73-112
Contract F33615-72-C-1764

Descriptors: *Gears, *Extrusion, Cladding, Feasibility studies, Fabrication, Aircraft equipment, Steel.
Identifiers: Steel M-50, Steel 4330.

The objective of this program was to demonstrate the feasibility of fabricating aircraft-quality bimetallic gears by the coextrusion process. Several material combinations (couples) were considered. M50 and 4330V modified were selected for the gear tooth cladding and core, respectively, on the basis of (1) acceptable material properties of each after having been subjected to a compatible heat treatment, and (2) demonstrated compatibility, residual compressive stress, and high-quality bond when coextruded in small, round-rod bars. Although some difficulty was encountered in the attempts to maintain the required geometric control, small spur gears (23-tooth, 18-diametrical-pitch) were successfully fabricated with a nominal cladding (M50) thickness of 0.015 inch. (Modified author abstract)

AD-776 993/8GA PC$8.50/MF$1.45
Battelle Columbus Labs Long Beach Calif Long Beach Research Facility
DETERMINATION OF THE EFFECT OF VARIOUS PARAMETERS ON WEAR AND FATIGUE OF WIRE ROPE USED IN NAVY RIGGING SYSTEMS.
Final rept. 1 Jun 70-15 Mar 72,
Philip T. Gibson, Charles H. Larsen, and Hobart A. Cress. 15 Mar 72, 106p Rept no. BATT-G-0534-1
Contract N00600-70-C-1045

Descriptors: *Wire rope, *Wear resistance, Fatigue(Mechanics), Failure(Mechanics), Sheaves(Drives), Bending, Life expectancy, Test methods.
Identifiers: Failure analysis.

The program was undertaken to help overcome the lack of general wire-rope design information by assessing the influence of various parameters common to the underway replenishment (UNREP) systems on the fatigue life of wire rope. The studies included analyses of the effects of single-sheave and multiple-sheave bends, reverse bends, sheave spacing, wire-rope core materials (IWRC, Sisal, Nylon, Polypropylene, and Dacron), and swivels. Both 1/2-inch and 3/4-inch diameter wire ropes were subjected to bending-fatigue experiments using sheave-to-rope diameter ratios of 15, 20, and 25 and factors of safety of 3, 5, and 8 based on actual measured rope breaking strength. Through these studies, information has been sought for improving UNREP equipment design and for developing preliminary wire-rope retirement criteria. (Author)

N74-17193/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF THE DYNAMICS OF A NUTATING BODY.
W. J. Anderson. Feb 74, 23p NASA-TM-X-7569, E-7696

Descriptors: *Mechanical drives, *Nutation, *Power transmission, *Shafts (Machine elements), Acceleration (Physics), Equations of motion, Numerical analysis.

For abstract, see STAR 1208

PAT-APPL-386 922 PC$4.00/MF$1.45
Department of Agriculture, Washington, D.C.
HAMMER MILL WITH INTEGRAL SUBSAMPLING PORTION.
Patent Application,
James W. Dickens. Filed 9 Aug 73, 4p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Hammer mills, *Patent applications, Grinding mills, Agricultural products, Grains(Food), Oilseeds, Grinding(Comminution).
Identifiers: PAT-CL-209-135.

The patent application relates to a mill for comminuting agricultural products such as peanuts, corn, soybeans, cottonseed and the like. The mill is characterized by the incorporation of an integral subsampling device whereby a comminuted, blended subsample is delivered concomitant the comminution operation.

PATENT-3 812 668 Not available NTIS
Department of the Interior, Washington, D.C.
ELECTROSTATIC SEPARATOR CARRIER ELECTRODE.
Patent,
Foster Fraas. Filed 8 Dec 59, patented 12 Dec 61, 4p PAT-APPL-858 002, DOCKET/MIN-385
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electrostatic separators, *Patents, Electrodes, Semiconducting films, Aluminum oxide, Nickel oxides, Copper oxides, Minerals.
Identifiers: PAT-CL-209-127.

The patent provides a more efficient separation of granular material by having an intrinsic or lattice defect type semiconductor for the surface of the conveying electrode which contacts the granular material. It provides an improved electrostatic separator having a solid high resistance film on the conductive conveying electrode which contacts the granular material. It further provides a contacting electrode having a high resistance metal oxide surface.

PATENT-3 293 829 Not available NTIS
Department of the Interior, Washington, D.C.
TOP CLOSURE FOR HIGH TEMPERATURE ELECTROSTATIC PRECIPITATOR.
Patent,
Leo Mafrica. Filed 27 Aug 63, patented 27 Dec 66, 6p PAT-APPL-305 014,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electrostatic precipitators, *Patents, Closures, Gas seals.
Identifiers: PAT-CL-55-104.

An object of the patent is to provide for use in an electrostatic precipitator a removable gas-tight closure having high electrical resisivity at high temperatures. Another object is to provide in an electrostatic precipitator, an adjustable insulator closure seal adapted to support the high voltage electrode of the precipitator in an accurately centered position relative to its surrounding enclosure. A still further object is to provide an arrangement facilitating the positioning of a top closure for an electrostatic precipitator wherein an insulator element is adjustably positionable upon a flexible pressure seal to maintain a high voltage electrode closely aligned along the central axis of the precipitator.

PATENT-3 788 465 Not available NTIS
Department of the Interior, Washington, D.C.
DEVICE AND PROCESS FOR MAGNETO-GRAVIMETRIC PARTICLE SEPARATION USING NON-VERTICAL SEPARATION PROCESS.
Patent,
George W. Reimers, Stephen A. Rholl, and Sanaa E. Khalafalla. Filed 28 Apr 72, patented 29 Jan 74, 6p PAT-APPL-248 705, DOCKET/MIN-1759
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Magnetic separators, *Patents, Separation, Particles, Fluids, Magnetic properties.
Identifiers: PAT-CL-209-1, *Magnetic fluids.

In the patent a volume of magnetic fluid caused to function as a density spectrograph by impressing a magnetic field upon the fluid in an orientation such that non-vertical levitation forces are developed upon particles immersed in the fluid. Particles are separated according to their density by passing them through the magnetic fluid. Interaction of particles within the fluid with the vector sum of gravitational and levitation forces causes each particle to travel a trajectory through the fluid characteristic of its density. Particles exit from the fluid at different locations, according to their density, thus allowing collection of density-graded fractions.

PB-230 109/1GA PC$4.00/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
RESTORATION OF DIRECT TEEMED INGOT MOULD BOTTOM PLATES USING THE ALUMINO-THERMIT PROCESS,
B. S. Butler. Feb 74, 9p GS/PROD/MISC/67/73/C

Descriptors: *Molds, *Thermit welding, Ingots, Pouring, Maintenance, Thermite, Metal plates, Plates(Structural members), Great Britain.

The thermit restoration technique as practiced at East Moors has been investigated. Trials involving an identical technique at Normanby Park have been witnessed and do not confirm the East Moors results. The value of the technique has been questioned and found to be highly dependant on existing practices. It is concluded that the quality of the bond at the repair interface is doubtful and can not be improved within the present economic limitations. The recommendation is not to institute any further development work. An appendix summarises the ingot mould repair work undertaken with British Steel Corporation.

13J. Marine Engineering

AD-776 739/5GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NEW ACHIEVEMENTS AT THE VDNKH (NATIONAL ECONOMY EXHIBITION OF ACHIEVEMENTS),
K. Lavrov. 8 Mar 74, 9p Rept no. FTD-HT-23-913-74
Edited trans. of Morskoi Sbornik (USSR) p87-88 Jul 73, by Frank C. Vaughn.

Descriptors: *Technology, Ships, Rust(Oxidation), Adhesives, Infrared equipment, Translations, USSR.

AD-776 861/7GA PC$4.00/MF$1.45
Webb Inst of Naval Architecture Glen Cove N Y
EXPERIMENTAL AND THEORETICAL EVALUATION OF SPRINGING ON A GREAT LAKES BULK CARRIER.
Final rept.,
Dan Hoffman, and Richard W. Van Hooff. Jul 73, 93p USCG-D-8-74
Contract DOT-CG-23027-A

Descriptors: *Cargo ships, Vibration, Stress testing, Damping, Bending moments, Ship structural components, Ship models.
Identifiers: Stewart J Cort vessel, *Ship springing, Bulk carriers.

Experiments were carried out on a model of the Great Lakes bulk carrier, Stewart J. Cort, jointed amidships, with four different connecting beams. These beams provided different degrees of stiffness and hence of natural frequency of vertical hull vibration. Springing was simulated in short regular waves generated in a model tank at various resonant combinations of model speed and wave length. At equal speeds the effect of increasing stiffness was found to be a decrease in the magnitude of springing at resonance when expressed as bending moment relative to wave slope. Parallel theoretical calculations were carried out which were found to be extremely sensitive to the level of damping introduced. Good agreement was obtained between trends of theory and experiment. If appropriate assumptions were made regarding damping, good agreement was also obtained in magnitudes of springing bending moments. (Author)

AD-776 997/9GA PC$5.75/MF$1.45
Bell Aerospace Co Buffalo N Y
U.S. ARMY LOGISTIC VOYAGEUR HARDENING ANALYSIS.
Final rept. May-Nov 73,
S. Watts. Nov 73, 220p Rept no. 7467-950001
Contract DAAK02-73-C-9318

Descriptors: *Army operations, *Surface effect ships, Modification, Ramps, Control systems, Marine surface propulsion, Unloading, Structural properties.
Identifiers: Voyageur vessels, Ship modification, *Design criteria.

The object of this analysis was to determine cost and feasibility of modifying a commercial air cushion vehicle (ACV) to meet requirements of the U.S. Army. The ACV which most nearly met these requirements was the Bell craft 'Voyageur'. The analysis address the following six areas: inclusion of a bow ramp, incorporation of wheels, substitution of diesel engine powering for the gas turbines, turbine air filtration, container off-loading facility, and adequacy for operating in eight feet plunging surf. (Modified author abstract)

AD-777 025/8GA PC$4.50/MF$1.45
Battelle Columbus Labs Ohio
ANALYSIS OF INLAND WATERWAYS OIL TRANSPORT TRAFFIC DENSITY PATTERNS.
Final rept. 1 Jun-31 Oct 73,
Robert A. Mendelsohn, William J. Sheppard, and C. Charles Kimm. 31 Oct 73, 119p* USCG-D-41-74
Contract DOT-CG-23223-A

Descriptors: *Inland waterways, *Marine transportation, *Oils, Gasoline, Fuel oil, Traffic, Forecasting, Density, Models.
Identifiers: Crude oil, Mississippi River, Missouri River, Illinois River, Tennessee River, Cumberland River, Big Sandy River, Kanawha River, Monongahela River.

The report presents forecasts of oil traffic on 9 rivers and in 15 selected ports of the Mississippi River System. Included is crude oil, gasoline, distillate fuel oil, and residual fuel oil traffic moving on the inland waterways. A baseline forecast is developed using historical data and commodity volumes are projected for the years 1975, 1980, 1985, and 1990. These forecasts are revised on the basis of industry analysis, and converted to numbers of tow movements based on tow size projections. (Author)

AD-777 038/1GA PC$3.75/MF$1.45
Naval Ship Research and Development Center Bethesda Md
DESIGN AND EVALUATION OF A HIGHLY SKEWED PROPELLER FOR A CARGO SHIP.
Final rept.,
Robert J. Boswell, and Geoffrey G. Cox. Feb 74, 60p* Rept no. NSRDC-3672

Descriptors: *Cargo ships, *Propellers(Marine), Skewness, Vibration, Cavitation, Cavitation corrosion, Wake, Ship models.

The design process and model evaluation of a highly-skewed propeller for a modern cargo ship are given. The design process is discussed in detail, including considerations of cavitation, mean and fatigue strength, and propeller-excited vibratory forces. Model experimental results are presented which tend to confirm the design process and to show that the highly skewed propeller possesses propulsion performance comparable to the propeller now fitted to the ship, delays the inception of cavitation by two knots, has less tendency towards cavitation erosion than the fitted propeller, and possesses adequate strength for ahead and steady astern operation. Calculations, using unsteady lifting-surface theory, indicate that the highly skewed propeller will reduce blade-frequency thrust and torque by 90%, will reduce blade-frequency transverse horizontal bearing force by 60%, and will increase blade-frequency vertical bearing force by 2%, compared to the propeller currently installed on the ship. (Author)

COM-74-10687/3GA PC$3.75/MF$1.45
Guss (Leonard) Associates, Inc., Tacoma, Wash.
MULTIPURPOSE HARBOR SERVICE CRAFT REQUIREMENTS STUDY. VOLUME I. SUMMARY AND RECOMMENDATIONS.
Feb 74, 65p* MA-RD-900-74045
Contract MA-3-36268
Prepared in cooperation with City of Tacoma, Wash. See also Volume 2, COM-74-10688.

Descriptors: *Boats, Fire fighting, Harbors, Law enforcement, Rescue operation, Surveys, Urban areas.

The purpose of the study was to develop performance requirements for a multi-purpose harbor service craft, comprising fire fighting, law enforcement and security, and rescue and first aid capabilities. A detailed analysis of Tacoma's needs for such a vehicle was performed, together with a survey of 16 other port cities. An assessment of this vehicle is presented, as well as its critical performance parameters.

COM-74-10688/1GA PC$4.75/MF$1.45
Guss (Leonard) Associates, Inc., Tacoma, Wash.
MULTIPURPOSE HARBOR SERVICE CRAFT REQUIREMENTS STUDY. VOLUME II. RESEARCH REPORT.
Feb 74, 144p* MA-RD-900-74044
Contract MA-3-36268
Prepared in cooperation with City of Tacoma, Wash. See also Volume 1, COM-74-10687.

Descriptors: *Boats, Fire fighting, Harbors, Law enforcement, Rescue operation, Pollution, Surveys, Urban areas.

The objectives of the study were to assess the need for, and interest in, a multi-purpose harbor services vessel which would, on a cost/effective basis, provide: fire fighting, security and law enforcement, rescue and boating safety, and pollution control services. The study was to determine the performance specifications for such a vessel, and to evaluate alternative designs and existing and proposed vessels. Three detailed subject reports were issued: on the literature search, the Tacoma Harbor Survey, and the National Ports Survey. This report includes key information from each of these subject reports, together with the establishment of required performance specifications and the equipment evaluation.

JPRS-61508 PC$4.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
PRICE LIST NO. 27 FOR REAPPRAISAL OF SHIPS IN MARITIME, RIVER, AND FISHING FLEETS--1 JANUARY 1973,
A. E. Berkov, N. V. Dymchenko, and O. A. Novikov. 19 Mar 74, 99p
Trans. of Tsennik No. 27 dy dlya Pereotsenki Sudov Morskogo, Rechnogo, i Rybopromyshlennogo Flota na 1 Yanvarya 1973 Goda, Moscow, 1972 111p.

Descriptors: *Ships, *Price surveys, Marine transportation, Waterway transportation, Fishing, USSR, Translations.

The report contains price list No 27 for the reappraisal of ships in the maritime, river, and fishing fleets as of 1 January 1973.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-777 014/2GA PC$4.00/MF$1.45
Battelle Columbus Labs Ohio
INVESTIGATION OF TECHNIQUES TO NONDESTRUCTIVELY TEST REINFORCED PLASTIC COMPOSITE PIPE.
Final rept. Sep 73-31 Mar 74,
M. J. Golis, R. P. Meister, J. L. Crowe, and G. J. Posakony. 31 Mar 74, 93p*
Contract DAAK02-74-C-0008

Prepared in cooperation with Battelle Pacific Northwest Labs., Richland, Wash. See also AD-774 294.

Descriptors: *Pipes, *Nondestructive testing, *Ultrasonic tests, Composite materials, Reinforced plastics, Fiberglass, Defects(Materials), Detection.

An in-depth study of ten nondestructive testing techniques has shown that ultrasonic methods are most suitable for inspecting reinforced plastic composite (RPC) pipe. Both liquid-coupled and air-coupled ultrasonic systems have been shown to be capable of detecting delaminations, inclusions, and uncured regions in 14 specially prepared sections of 3-inch-diameter fiberglass pipe. Plan view C-scans were recorded using both techniques. The liquid-coupled system showed higher resolution and sensitivity to small-area reflections. Recommended inspection system specifications are listed based upon the performance of laboratory equipment used in the program. (Author)

N74-17641/3GA PC$4.75/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A HOMOGENEOUS HEAT PIPE DESIGN CODE.
A. M. Nakashima, and G. M. Kikin. 15 Jan 74, 34p NASA-CR-136831, JPL-TM-33-663
Contract NAS7-100

Descriptors: *Computer programs, *Heat pipes, *Heat transfer, *Thermodynamic properties, *User manuals (Computer programs), Equipment specifications, Numerical analysis, Prediction analysis techniques, Product development.

For abstract, see STAR 1208

N74-17643/9GA PC$10.00/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
VARIABLE CONDUCTANCE HEAT PIPE TECHNOLOGY.
B. D. Marcus, D. K. Edwards, and W. T. Anderson. Dec 73, 140p NASA-CR-114686, RR-4
Contract NAS2-5503

Descriptors: *Heat pipes, *Heat transfer, *Materials tests, *Research projects, Product development, Systems engineering, Thermodynamic properties.

For abstract, see STAR 1208

PATENT-2 996 439 Not available NTIS
Department of the Interior, Washington, D.C.
ROTARY STILL.
Patent,
Robert E. Glover. Filed 16 Dec 58, patented 15 Aug 61, 7p PAT-APPL-780 908, DOCKET/SAL-315
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Stills, *Distillation equipment, *Rotary compressors, Desalting, Condensers(Liquefiers).
Identifiers: PAT-CL-202-236.

This invention relates to rotary stills for compression distillation. It consists of a rotary still wherein the compressor and heat exchange unit are located in the same zone. This rotary still is especially useful for the distillation of saline waters, including sea water and brackish water, to produce pure potable water.

PATENT-3 184 789 Not available NTIS
Department of the Interior, Washington, D.C.
APPARATUS FOR LARGE-SCALE APPLICATION OF MONOMOLECULAR LAYERS TO WATER SURFACES USING MELTED MATERIAL.
Patent,
Quentin L. Florey, and Lloyd O. Timblin, Jr. Filed 7 Apr 64, patented 25 May 65, 5p PAT-APPL-362 548, DOCKET/REC-732, DOCKET/MIN-498
Previously filed as PAT-APPL-121 261, 30 Jun 61.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Monomolecular films, *Evaporation control, *Sprayers, Powders(Particles), Acyclic alcohols, Melting.
Identifiers: PAT-CL-18-2-4.

This invention relates to a means for distributing or spreading evaporation retarder or suppressor materials on the surface of water in open storage as in lakes or reservoirs. Basic to the present invention is the concept of melting the solid higher fatty alcohol material, and spraying the resulting liquid as a fine mist into the atmosphere over the water to be conserved.

13L. Safety Engineering

AD-776 417/8GA PC$3.25/MF$1.45
Battelle Columbus Labs Ohio
REVIEW AND EVALUATION OF THE LITERATURE ON ELECTROSTATIC GENERATION IN TANK CLEANING.
Final rept. 3 Apr-16 Oct 73,
Robert B. Reif, and Samuel A. Hawk. Feb 74, 41p USCG-D-76-74
Contract DOT-CG-23223-A

Descriptors: *Static electricity, *Safety, *Tankers, Explosions, Electrostatics, Tanks(Containers), Cleaning, Reviews.

Explosions that occurred in three very large crude tankers in December, 1969, called attention to a probable electrostatic problem related to washing operations in the large tanks. Much of the effort subsequently applied in the study of this problem has been influenced by the fact that these explosions occurred in large tankers. However, explosions also have occurred on small crude carriers during washing operations. Static electricity was suspected in at least one of the smaller tanker incidents although falling anodes usually have been blamed for such incidents. Acceptance of this simple explanation possibly prevented earlier recognition of the spark hazard due to static electricity. The report is based on a review of literature available at Battelle and supplied by the U.S. Coast Guard. The purpose of this review has been to establish what is known with a degree of certainty and from this review to determine, if possible, what sort of information is still needed and what investigations should be made to provide a practical and certain solution for the static problem in tankers. Conclusions and recommendations for further research are given. (Author)

COM-74-50303/8GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Fire Technology Div.
FIRE ACCIDENTS INVOLVING THE IGNITION OF SLEEPWEAR WORN BY CHILDREN UNDER THE AGE OF THREE.
Final rept.,
Elaine A. Tyrrell. Feb 74, 23p NBS-TN-815
Paper copy available from GPO $0.60 as C13.46:815.

Descriptors: *Accidents, *Fires, *Children, *Clothing, *Flammability, Standards, Fabrics, Ignition, Burns(Injuries).
Identifiers: *Children's sleepwear.

Accident case histories of children under age three involved in sleepwear fires are examined in detail. Of 434 persons involved in sleepwear ignition incidents in the NBS Flammable Fabrics Accident Case and Testing System as of January 1973, 101 were children under age six; 22 of these were children under age three. In 15 of these 22 accidents, the child was a victim of his own actions, while in seven more accidents, the child played a passive role in the ignition sequence. Matches and kitchen ranges were the most frequent ignition sources found for this group of children. Seven of these small children died; the remaining 15 victims sustained burn injuries covering from one to 65% of their bodies. Most of the sleepwear items involved in these 22 accidents were made of cotton and 14 of these 22 items were pajamas.

COM-74-50304/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Fire Technology Div.
KITCHEN RANGES IN FABRIC FIRES.
Final rept.,
Alan K. Vickers. Apr 74, 22p NBS-TN-817
Paper copy available from GPO $0.60 as C13.46:817.

Descriptors: *Accidents, *Fires, *Flammability, *Fabrics, Kitchen equipment and supplies, Clothing, Ignition, Burns(Injuries), Death.

Kitchen ranges played a major role in the 1616 fabric accident case histories recorded in the Flammable Fabrics Accident Case and Testing System as of May 1972. They accounted for 214 or 35% of the direct garmet ignitions in FFACTS. Female victims outnumbered males by 3 to 1; females under 16 and over 65 were particularly heavily represented. Reaching over and leaning against the range caused the majority of the garmet ignitions. Shirts, robes, pajamas, nightgowns and dresses were the most frequently ignited garments. Thirty-four victims died from injuries resulting from garment ignitions from ranges; 24 of these fatalities were people over 65 years old.

CONF-731122-1 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
DESIGN OF INDUSTRIAL FACILITIES TO MITIGATE EFFECTS OF DISASTERS.
T. W. Jr. Pickel. 1973, 9p

Descriptors: (*Industrial plants, *Safety engineering), Design, Hazards.

For abstract, see NSA 29 07, number 15538.

PAT-APPL-434 162 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
AN OPTICAL DETECTION SYSTEM.
Patent Application,
Martin Hertzberg, Charles D. Litton, John N. Murphy, and H. Kenneth Sacks. Filed 17 Jan 74, 19p DOCKET/MIN-2029
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fire detection systems, *Optical detection, *Patent applications, Explosions, Mine safety, Spectrum signatures, Detection, Mine gases, Fires.
Identifiers: PAT-CL-340-227.

The patent application describes a system for detecting fires or explosions by looking at the spectral radiant energy emitted from the ignited gaseous mixture. More specifically, the energy is detected by a plurality of detectors operating over a central band region and adjacent side band regions.

PB-230 004/4GA PC$4.00/MF$1.45
California Univ., Berkeley. Fire Research Group.
FIRES-T. A COMPUTER PROGRAM FOR THE FIRE RESPONSE OF STRUCTURES - THERMAL,
James M. Becker, Hani Bizri, and Boris Bresler. Jan 74, 76p UCB-FRG-74-1
Grant NSF-GI-43

Descriptors: *Structural members, *Thermal properties, *Fire resistance, *Computer programs, Fire safety, Heat transfer, Control sequences.
Identifiers: FIRES T computer program, Finite element analysis.

The report describes the current version of the computer program FIRES-T (FIre REsponse of Structures - Thermal); the program is capable of evaluating the temperature distribution history of general structural cross-sections subjected to fire environments. A finite element formulation which considers the temperature dependence of thermal properties is used in FIRES-T. The finite element formulation, the idealization of the fire boundary condition, and the general numerical approach used in the program are discussed. Included in the report are appendices that provide a users' guide for FIRES-T, sample problems with listings of their input and output, and a complete listing of the computer program, FIRES-T. (Author)

PB-230 466/5GA PC$3.25/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
COST-EFFECTIVENESS AND ALCOHOL-RELATED HIGHWAY SAFETY COUNTERMEASURES. AN ANNOTATED BIBLIOGRAPHY WITH COMMENTARY.
Final rept. 15 Feb-15 Mar 74,
Richard L. Douglass, and Kenneth R. Farr. Mar 74, 48p* UM-HSRI-AL-74-3

Descriptors: *Motor vehicle operators, *Alcoholism, *Bibliographies, Safety engineering, Benefit cost analysis, Vehicular traffic, Reviews.
Identifiers: *Alcohol usage, *Highway safety.

A literature review of cost-effectiveness, cost-benefit analysis and related topics determined that these planning technologies are rarely utilized in the area of alcohol-related highway safety countermeasures. The authors describe the situation as it is reflected in the literature. A rank-ordering of different modes of alcohol-related countermeasures according to specificity to target populations and objectives is presented according to subjective estimates of relative cost-effectiveness. Recommendations are offered regarding alcohol-related countermeasure planning and implementation. Annotated and unannotated bibliographies accompany the commentary.

PB-230 468/1GA PC$20.25/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
INVESTIGATION OF THE DYNAMIC IMPACT CHARACTERISTICS OF ROADSIDE STRUCTURES.
Final rept.,
Duane F. Dunlap, Philip Grote, David M. Fram, and William Mashinter. 12 May 72, 43p UM-HSRI-PF-72-5

Descriptors: *Barriers, *Crash tests, Collision research, Dikes, Automobiles, Safety engineering.
Identifiers: *Vehicle fixed object collisions, Curbs, Guardrails.

Impact performance assessments of four types of roadside structures are presented. An earthen mound guardrail end treatment is found to be unsatisfactory, while an absorber, break-away treatment is found to be more promising although requiring design modifications. Five MDSH standard curb configurations were subjected to simulated impacts and are found to affect vehicle motions as a function of height, face profile and surface texture. Eight common curb/guardrail combinations are evaluated in terms of vaulting potential; all are found to be safe, provided specific guardrail height and set back guidelines are adhered to. The MDSH standard median dike profile is found to be unsafe and in need of flatter side slopes. Appendices are presented which contain detailed discussions of simulation modeling methods, test acceleration measurements and roadside structure development procedures. (Author)

PB-230 617/3GA PC$3.25/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Surface Transportation Safety.
MISSOURI PUBLIC SERVICE COMPANY, CLINTON, MISSOURI, DECEMBER 9, 1972.
Pipeline accident rept.
27 Feb 74, 29p NTSB-PAR-74-3

Descriptors: *Gas pipelines, *Accident investigations, Central city, Explosions, Fires, Gas mains, Leakage, Death, Injuries.
Identifiers: *Pipeline accidents.

The report describes and analyzes a gas explosion and fire which occurred on December 9, 1972, in downtown Clinton, Mo. Gas had leaked into a building from a cracked cast-iron main located behind the building. Missouri Public Service Company personnel arrived at the site of the reported leak 50 minutes before the explosion. Eight persons died, and seven others were injured. The National Transportation Safety Board determines that the probable cause of the explosion was the ignition of gas that had leaked from a cast-iron main cracked by a combination of soil stresses and railroad vibration, which applied a bending force to the pipe in an area weakened by graphitization. Contributing to the explosion were the failure of the gas company to shut off the flow of gas to the leak site and the inadequate efforts of the gas-company personnel to prevent the ignition of the leaking gas detected in the building.

13M. Structural Engineering

AD-776 367/5GA PC$3.00/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
ELECTROMAGNETIC SHIELDING OF STRUCTURES.
Final rept.,
Paul Nielsen. Jan 74, 23p Rept no. CERL-TR-E-29

Descriptors: *Structures, *Electromagnetic shielding, Shielding, Construction.
Identifiers: Design.

Electromagnetic shielding of large volumes is possible with structures fabricated from low-resistance, high-permeability materials. Structural non-uniformities, such as doors, power and signal entry ports, and air conditioning ducts tend to degrade shielding effectiveness. These and a number of other construction details must be properly handled to avoid excessive shielding degradation. These details are discussed in this report. An annotated bibliography of publications on the subject of electromagnetic shielding is included. (Author)

AD-776 587/8GA PC$3.25/MF$1.45
Naval Undersea Center San Diego Calif
CAST ACRYLIC PLASTIC DOME FOR UNDERSEA APPLICATIONS.
Research and development rept.,
Jerry D. Stachiw. Jan 74, 32p* Rept no. NUC-TP-383

Descriptors: *Domes(Structural forms), *Underwater structures, Hemispherical shells, Acrylic resins, Spheres, Windows, Submersibles, Habitability, Underwater, Casting, Deep submergence, Deep submergence vehicles.

An acrylic plastic hemispherical dome with a 78-inch outer diameter, 65.25-inch inner diameter and 7-inch-long skirt has been successfully cast, machined, and equipped with a metallic mounting flange. The mounting flange will allow mating of the cast plastic dome to a surface ship hull, where it will serve as an impact-resistant undersea observation chamber that will afford its occupants panoramic vision of subsurface hydrospace. Other potential applications for such cast domes are in deep submergence vehicles, continental shelf ocean bottom habitats, pressurized aquaria, and hyperbaric chambers. This dome is applicable to depths in the 0- to 2,500-foot range providing that the right method is used for attaching the dome to the vehicle or habitat. The mechanical properties of the massive dome casting have been found to be significantly less than the typical properties of flat plates cast solely from acrylic monomer. (Author)

COM-74-10751/7GA PC$6.50/MF$1.45
National Bureau of Standards, Washington, D.C. Center for Building Technology.
INTERNATIONAL ACTIVITIES, CENTER FOR BUILDING TECHNOLOGY - 1972.
Final rept. Jan-Dec 72,
Charles C. Raley. Aug 73, 69p NBSIR-74-432

Descriptors: *Residential buildings, *Construction practices, *International relations, Environmental engineering, Construction materials, Wind pressure, Fire resistance, Acoustic properties, Plumbing, Single family houses, Economic factors, Quality, Tests, Mobile homes, Climatology, Structural plastics, Foundations.
Identifiers: *Building technology.

The report summarizes the Center for Building Technology's 1972 international activities including formal cooperative programs, exchange programs, special projects, international organization memberships, foreign guests at CBT, and CBT foreign travel.

COM-74-50270-01/GA PC-GPO/MF$1.45-NTIS
Bureau of Domestic Commerce, Washington, D.C.
CONSTRUCTION REVIEW. VOLUME 20, NUMBER 1, JANUARY 1974.
Monthly rept.
Jan 74, 72p
Paper copy available from GPO $11.50/year as C41.30/3:20, $1.00/copy as C41.30/3:20/1.

Descriptors: *Construction, *Reviews, Technology transfer, Housing starts, Residential buildings, Building permits, Contract awards, Costs, Prices, Statistical data, Construction materials, Employment statistics.
Identifiers: Monthly summaries.

Monthly statistical summaries are given with comparative data for previous years, for private and public housing units by SMSAs, type, and geographic regions; new construction permits; contract awards for federal residential and nonresidential buildings, highways, and housing projects including additions and alterations; indexes of costs, wholesale prices, and union wages; indexes of materials production, shipments, and stocks; and contract employment by type of contractor. A special feature is presented on transferring space technology to construction.

PB-228 759/7GA PC$14.50/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
THE DESIGN OF A DATA-BASE INFORMATION SYSTEM FOR BUILDING DESIGN,
Jeffrey Joseph Folinus. Oct 73, 226p R73-52, Structures Pub-379 NSF-GK-25510X-16
Grant NSF-GK-25510

Descriptors: *Information systems, *Structural design, *Buildings, Computer programming, Information retrieval, Design.

The investigation presents the need for information sharing in a project-oriented environment, and a possible solution to this need, the computer-based information system. Such a system appears to be part of longer term trends in the computing field. The particular requirements that are imposed on a data-base information system by the nature of the building design process are analyzed, and a prototype system satisfying many of these requirements is proposed as a benchmark effort. The form of an implementation of this system under the Integrated Civil Engineering System (ICES) is suggested, as is the interface of this information system with various levels of user. (Author)

PB-229 871/9GA PC$4.50/MF$1.45
Oregon State Univ., Corvallis. Dept. of Mechanical Engineering.
OFFSHORE RESEARCH TOWER. A DESIGN REPORT.
Final rept.,
John H. Nath, and James L. Washburn. Nov 73, 122p* NSF-GK-35799X
Grant NSF-GK-35799

Descriptors: *Offshore structures, *Towers, Research, Anchors(Structures), Design, Instruments, Recording instruments, Oceanographic data, Construction, Cost estimates, Wind velocity, Ocean waves, Force, Pacific Ocean, Oregon.
Identifiers: *Offshore towers.

The report describes the design of an off-shore research tower. It was originally planned to construct this tower in preparation to investigate wind forces and wave forces on off-shore structures and the correlation between these two forces. The construction was postponed until a later date. The structure was to be installed at Stonewall Bank, which is situated about 15 miles off the Oregon coast. This area has a gentle rise in the floor of the ocean up to a water depth of about 140-150 feet. This report shows that the construction of such a research tower is feasible and that the probability of survival for a two year period is high. The proposed instrumentation system is simple. The design and installation procedure as presented can be used in other shallow areas of the ocean. In addition, the use of the structure and procedure presented need not be limited to a project of wind and wave forces, but can, indeed, be used for many other kinds of ocean engineering and oceanographic research. (Modified author abstract)

PB-229 889/1GA PC$5.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
CREATING A NATIONAL MARKET FOR INNOVATION IN BUILDING. PART I. ALTERNATIVE REGULATORY MECHANISMS,
Steve R. Rivkin. 15 Jun 73, 40p HUD-PDR-131
Prepared by Nicholson and Carter, Washington, D.C. Paper 34 on National Housing Policy Study Papers. Background Studies. Volume 3.

Descriptors: *Building standards, *Federal policies, *Planning, Building codes, Definitions, State programs, Criteria, Methodology, Public administration, Recommendations.
Identifiers: Innovations, Certification, Authority, *Housing and urban development research.

The paper points out three broad approaches to the problem of how a stronger federal role in building regulation might be achieved. They are federal definition of standards for particular building products; promulgation of a federal building code to be enforced by the states; and federal certification of state processes, mechanisms, and criteria for building regulation within an overall framework of statutory and administrative guidelines. An additional combination of these approaches resting on certification but with stand-by authority for issuance of product standards on codes is also discussed.

PB-230 001/0GA PC$3.75/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
THE INFLUENCE OF MODEL CODES AND THEIR ASSOCIATIONS ON ACCEPTANCE OF INNOVATIVE TECHNOLOGY AT THE LOCAL LEVEL, ARTHUR S. GOLDMAN.
Aruthur S. Goldman. 15 Jun 73, 70p* HUD-PDE-139
Paper 43 on National Housing Policy Study Papers. Background Studies. Volume 3. Prepared by Building Systems Development, Inc., San Francisco, Calif.

Descriptors: *Building codes, *Community relations, Revisions, Public opinion, Attitudes, Standardization, Technology innovation, Management, Problem solving, Defects, Recommendations.
Identifiers: Local options, *Housing and urban development research.

Positive change has occurred concerning model building codes and related problems since 1968. The codes influence acceptance of innovative technologies at the local level, but existing systems and institutions do not resolve the major gaps, blockage and problems. Decisive action is required. The first step may be the establishment of a national institute of building sciences. Wide concensus indicates that if nationally approved standards and better resource information were available many code related problems would not persist.

PB-230 108/3GA PC$6.50/MF$1.45
British Steel Corp., Sheffield (England). Information Services.
STIFFENED PLATE FLANGE TEST IN A CONTINUOUS TWO-SPAN BOX GIRDER,
P. L. Disney, and J. E. Dibley. Feb 74, 69p CEL/-/47/73

Descriptors: *Box beams, *Girders, Structural flanges, Loads(Forces), Destructive tests, Great Britain.

The report contains a detailed account of the test to collapse of a two-span continuous box girder 42.7 m in overall length, 0.91 m deep and 2.4 m wide. Point loads were applied at mid-span simultaneously and increased in increments to collapse. Measurements of initial imperfections, residual stresses, material properties, stresses, deflections and bearing reactions were obtained. A detailed description of the test, including the measurements recorded, is presented together with an analysis of the results, conclusions and recommendations for further research. (Modified author abstract)

PB-230 618/1GA PC$3.00/MF$1.45
Bureau of Reclamation, Denver, Colo. Engineering and Research Center.
HYDRAULIC MODEL STUDIES OF O'SULLIVAN DAM, COLUMBIA BASIN PROJECT,
P. H. Burgi. Sep 73, 16p REC-ERC-73-15

Descriptors: *Dams, *Hydraulic models, *Spillways, Open channel flow, Washington(State).
Identifiers: O'Sullivan Dam.

Hydraulic model studies were made to verify the design of the spillway, approach channel, and spillway chute for O'Sullivan Dam. Discharge rating curves are presented relating spillway discharge capacity to pier location upstream of the crest, at the crest, and dowastream from the crest. The preliminary approach channel design was modified to improve the entrance flow conditions. Operating criteria for the spillway gates are recommended to assure acceptable flow conditions in the spillway chute. (Modified author abstract)

PB-230 697/5GA PC$6.00/MF$1.45
Forest Products Lab., Madison, Wis.
FIRE ENDURANCE OF WOOD-FRAME AND SANDWICH WALL PANELS,
H. W. Eickner. Mar 74, 59p

Descriptors: *Sandwich panels, *Fire resistance, *Walls, *Houses, Fire tests, Acceptability, Criteria, Loads(Forces), Plywood, Hardwoods, Wallboard, Gypsum products, Cores, Polyurethane resins, Honeycomb laminates, Foam plastics.
Identifiers: Fire endurance tests.

To serve as a basis for establishing acceptance criteria for structural sandwich panels in housing, fire endurance tests were conducted on five exterior wood-frame and nine sandwich wall panels under load. The fire endurance of the exterior wood-frame walls when tested from the interior side ranged from 16 to 35 minutes, with the least fire endurance being obtained with the framed wall with 1/4-inch hardwood plywood on the interior. The other stud walls 3/8-inch gypsum wallboard on the interior had endurances of 29.5 to 35 minutes. Results are also given for unprotected sandwich assemblies of 1/4-inch plywood or hardboard facings on 3-inch thick cores of polyurethane foam, isocyanurate foam, and paper honeycomb.

UCID-15531 PC$5.75/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
STRUCTURAL RESPONSES AND DAMAGE THRESHOLDS DUE TO GROUND EXCITATION.
C. Y. King. 14 Oct 69, 72p

Descriptors: (*Buildings, *Seismic effects), (*Mechanical structures, Seismic effects), (*Nuclear explosions, *Ground motion), (*Chemical explosions, Ground motion), Earthquakes, Underground explosions.

For abstract, see NSA 29 07, number 15535.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-776 317/0GA PC$3.25/MF$1.45
Arnold Engineering Development Center Arnold Air Force Station Tenn
EVALUATION OF A WIND TUNNEL TECHNIQUE TO DETERMINE AIRCRAFT DEPARTURE CHARACTERISTICS.
Final rept. 2 Feb-18 May 73,
R. W. Butler. Mar 74, 30p Rept no. AEDC-TR-73-183
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-PWT-TR-73-121.

Descriptors: *Attack aircraft, *Stalling, *Wind tunnel tests, *Model tests, Scale, Subsonic characteristics, Computer applications, Digital computers, High altitude, Angle of attack, Flight simulation, Instrumentation, Captive flight, Equations of motion, Mathematical models.
Identifiers: *Aircraft departure characteristics, A-7 aircraft, A-7D aircraft, Captive aircraft departure systems.

A wind tunnel pilot test was conducted to develop a captive aircraft testing technique. By utilizing wind tunnel research to determine the static aerodynamic forces and moments in conjunction with an on-line digital computer programmed with the equations of motion, a series of aircraft stall/departure type maneuvers was generated. A 1/72-scale A-7D aircraft model was utilized. All maneuvers were initiated at Mach number 0.50 at a simulated altitude of 20,000 ft. (Modified author abstract)

AD-776 318/8GA PC$3.25/MF$1.45
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
FREE JET ENGINE TESTING: WIND TUNNEL STARTING,
Paul J. Ortwerth. Dec 73, 33p Rept no. AFAPL-TR-73-105

Descriptors: *Wind tunnels, *Diffusers, Jet engines, Test equipment, Fluid dynamics, Aerodynamic drag, Starting.

Free jet wind tunnels are used extensively for jet engine testing and development. A facility diffuser is employed for altitude simulation. Diffuser size and performance must be matched to the exhauster pumping capacity and engine installation drag or diffuser unstarts will occur. The diffuser starting theory of Rudolf Herman was reviewed and extended to determine the allowable drag coefficient of ramjet test installations in free jet wind tunnels. Specific drag limits are calculated for the Air Force free jet test stand located at The Marquardt Corporation, Van Nuys, California. (Author)

AD-776 344/4GA PC$3.75/MF$1.45
Army Electronics Command Fort Monmouth N J
PULSER FOR EMP SIMULATION.
Technical rept.,
William H. Wright, Jr. Feb 74, 74p Rept no. ECEM-4198

Descriptors: *Electromagnetic pulse simulators, Pulse generators, Capacitors, Discharge, High voltage, Nuclear explosions, Electromagnetic pulses.

The project was undertaken to provide a pulser capable of driving a low-impedance array of antennas with a high-peak-power, short risetime pulse to simulate the electrical interference effects of an electromagnetic pulse (EMP). The final pulser produced a 100 kilovolt (kV), 72 kiloamperes (kA) output pulse with a 6 nanosecond (ns) voltage risetime and 42 ns current risetime through a single output switch. Additional experiments showed how multiple output switches could reduce the current risetime to 14 ns with a 9 ns jitter. The output switch was a water-or-air-filled spark gap, and operation in both modes is described. The report also includes design information on a simple and reliable 100 kV d.c. switch, a low-impedance high power dummy load, and voltage and current measuring devices for viewing fast transients. (Modified author abstract)

AD-776 356/8GA PC$3.25/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
THREE-DIRECTIONAL LOAD TRANSDUCER.
Final rept. 21 Apr-21 Jul 72,
Anthony R. Clemente, Richard Madden, James B. Blackwell, and Paul J. Remington. Apr 73, 39p Rept no. BBN-2538 USA-NLABS-TR-74-28-GP Contract DAAG17-72-C-0116

Descriptors: *Transducers, Loads(Forces), Calibration, Measuring instruments, Tents, Inflatable structures, Fastenings.

The report describes a three-directional load transducer to be used for measuring loads in tent tie downs. Included in the report are mechanical descriptions of the parts of the transducer and their functions, a method for determining approximate transducer sensitivity, a discussion of bridge wiring, calibration procedures, and the results of the calibration. An appendix presents raw calibration data. (Author)

AD-776 575/3GA PC$10.75/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
LARGE, HIGH-PRESSURE VESSELS FOR SIMULATING THE DEEP OCEAN.
Technical rept.,
Jack R. Maison. Jul 73, 562p Rept no. NCEL-TR-794

Descriptors: *Deep oceans, *Test facilities, *Pressure vessels, Simulation, Submarine hulls, Steel, Concrete, Filament wound construction, Naval research.

The current capabilities and limitations in the design and fabrication of large, high-pressure ocean simulators is reviewed. Test chambers up to 20 feet in diameter, 60 feet in length, rated to 30,000 psig (RDT+E tanks) and 75 feet in diameter, 600 feet in length, rated to 4,000 psig (Fleet support chambers) are considered. Of the concepts considered feasible for fabricating the simulators, wire-wound construction was found to produce the lowest cost chambers. The core material upon which the wire is wound should be either high-strength steel for the RDT+E tanks or high-strength concrete for the Fleet support chamber. Steel cores are limited in size by billet weight and forging press capacity but are unlimited in pressure up to the maximum considered; concrete cores are unlimited in size, but are constrained to a maximum pressure of about 4,000 psig. An RDT+E program in support of wire-wound construction is included (Modified author abstract)

AD-776 771/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DEVICE FOR REGISTRATION OF THE RATE OF PROPAGATION OF A SHOCK WAVE FRONT,
P. N. Zaev, Yu. V. Petrov, N. P. Trushechkin, and I. K. Shvarov. 25 Mar 74, 6p Rept no. FTD-HT-23-1360-74
Edited trans. of Patent (USSR) 259 192 p1-2, 12 Dec 69, by Kathleen L. Dion.

Descriptors: *Shock waves, *Measuring instruments, Shock tubes, Translations, USSR, Patents.

The investion belongs in the area of radio electronics and measuring technology and is intended for measurement of the distribution rate of the critical ionization front in a shock wave during shock tube experiments. A device is known for measurement of shock wave speed, based on digital measurement of the time passed by the constant phase of a SHF standing wave excited in a shock tube channel, a distance equal to half the length of the SHF wave in the channel of the device, which contains a generator, pick up and SHF detector, scaling circuit and registration block. (Author)

AD-776 825/2GA PC$6.25/MF$1.45
Air Force Special Weapons Center Kirtland AFB N Mex
IMPROVED SPACE-TIME REFERENCE SYSTEMS FOR USE ON ROCKET SLED TRACK.
Final rept. Apr-Oct 72,
Anthony S. Hu, and Robert J. Sabin. Oct 72, 62p Rept no. AFSWC-TR-72-43

Descriptors: *Rocket sleds, *Timing devices, Air Force facilities, Coaxial cables, Radio transmission, Amplitude modulation, Spatial distribution, Lasers, Phase modulation.
Identifiers: Holloman Air Force Base.

Two space-time reference systems are presented in the report. The first system uses a coaxial cable with periodic open slots installed along the track and the second system uses a reflecting ribbon etched with non-reflecting pattern. Both systems are capable of measuring tracked sled velocity with more than one order of magnitude improvement over the present light interrupter system. (Author)

AD-776 881/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A DEVICE FOR THE SYNCHRONIZATION OF RECORDERS AND MEASUREMENT OF SHOCK WAVE VELOCITY ON AERODYNAMIC SHOCK INSTALLATIONS,
V. P. Kremena, and Yu. V. Petrov. 25 Mar 74, 14p Rept no. FTD-HT-23-1362-74
Edited trans. of Patent (USSR) 299 759 p1-5, 25 Mar 72, by James R. Moore.

Descriptors: *Inventions, *Fluid mechanics, Velocity, USSR, Shock waves, Measurement, Automatic, Recording systems, Aerodynamic forces, Translations, Patents, Synchronism.

The invention pertains to the automatization of measurements on aerodynamic shock installations and can be used for synchronizing the start of the appropriate recorders in the predetermined measurement section of the installation tube at the moment when the front of a shock wave or its part that is of interest is detected in it, and also for measuring the velocity of the front on the measurement base.

AD-776 900/3GA PC$3.25/MF$1.45
Picatinny Arsenal Dover N J
AN EXPERIMENTAL NEUTRON RADIOGRAPHY SYSTEM USING CALIFORNIUM-252.
Final rept.,
Emmett G. Barnes, George Drucker, Alexander Jentisch, and Samuel Helf. Mar 74, 28p Rept no. PA-TR-4629

Descriptors: *Neutron radiography, *Californium, *Nondestructive testing, Containers, Ammunition, Instrumentation, Radiographic film.
Identifiers: Materials handling, Moderators, Neutron sources, Californium 252.

Neutron radiography was studied as a method for the nondestructive examination of loaded Army munitions items. A ten-milligram Californium-252 source was acquired and facilities for its use as a primary neutron source were developed. A versatile source-handling mechanism which accommodates a number of different experiments was devised by modifying a standard cobalt-60 source system, and was incorporated as an integral part of the storage/shipping container. Two moderator designs have been used thus far. Applications of neutron radiography using the californium source have included 100 percent examination of a pilot production run of 1,300 explosive boosters, as well as a variety of other small munitions items. (Modified author abstract)

AD-776 934/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
AUTOMATIC UNIT SEEKS OUT DEFECTS,
N. Sorokin. 8 Mar 74, 5p Rept no. FTD-HT-23-1535-74
Edited trans. of Vechernyaya Moskva (USSR) n245 p3, 18 Oct 73, by Dean F. W. Koolbeck.

Descriptors: *Nondestructive testing, Eddy currents, X ray apparatus, Defects(Materials), Detection, Quality control, Translations, USSR.

The article discusses an instrument which instantaneously seeks out the finest flaws on the surface of articles. Its operating principle is based on excitation of eddy currents in the monitored section. The article also discusses a television X-ray introscope which converts X-radiation into light radiation and transmits it to a television screen. A part which is placed in the instrument is illuminated and the picture of internal defects in the metal appears on the screen; all of its internal 'diseases' are visible - shrinkage defects, cracks, etc.

AD-776 948/2GA PC$3.75/MF$1.45
Army Engineer Topographic Labs Fort Belvoir Va
FURTHER INVESTIGATION OF AN ELECTRONIC ANGLE-MEASURING DEVICE.
Technical rept.,
William W. Seemuller. Dec 73, 52p Rept no. ETL-TR-74-1

Descriptors: *Angles, *Measuring instruments, Electronic equipment, Standard deviation, Computer programs, Minicomputers.
Identifiers: HP 2114A minicomputers.

The report presents the results of extended experimentation on an electronic angle-measuring device to determine precision and accuracy. The instrument measures an angle by measuring the time it takes a rotating disk to sweep out the angle. Time is indicated by counting the cycles of a stable

oscillator which is gated on and off by the disk at points determined by the angle being measured. (Modified author abstract)

AD-776 953/2GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
VELOCITIES OF FALLING DROPLETS ONE MILLIMETER IN DIAMETER.
Final technical rept. May 71-Jun 72,
John B. Samuel, Elwin C. Penski, and Harry A. Brown, Jr. Mar 74, 17p Rept no. EC-TR-73071

Descriptors: *Drops, *Falling bodies, *Velocity, Measurement, Nitrobenzenes, GB agent, Reynolds number, Drag, Coefficient, Sizes(Dimensions), Photography, Measuring instruments.
Identifiers: *Velocity measurement.

Experimental apparatus and techniques described measure the rate of fall of liquid droplets. The velocity of freely falling and accelerating 1.0 mm (approx.) diameter drops of nitrobenzene and chemical agent GB were studied at Reynolds numbers below 230 under ambient atmospheric conditions. The experimentally-determined velocities were compared with those calculated using the drag coefficients of water droplets moving at terminal velocity. (Author)

AD-776 965/6GA PC$3.25/MF$1.45
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
A TECHNIQUE FOR EVALUATING FUEL MIST FLAMMABILITY.
Interim rept.,
Bernard R. Wright, Leo L. Stavinoha, and William D. Weatherford, Jr. Dec 73, 26p Rept no. AFLRL-25
Contract DAAK02-73-C-0221

Descriptors: *Flammability, *Mist, Jet engine fuels, Experimental design, Laboratory equipment, Fuels, Liquids, Measurement.
Identifiers: Flashback.

Experimental apparatus and procedures for evaluating the mist flammability of neat and fire-safety fuels have been developed. The apparatus, which was developed as part of this laboratory's fuel safety program, is capable of evaluating fuel mist flammability under conditions ranging from low air shear to extremely high air shear. Fuel is delivered through a capillary at a controlled rate, and three impinging air streams form a mist at the point of impingement. The fuel mist passes through an overwhelming ignition source to avoid marginal ignition. Flashback from the ignition source toward the fuel capillary is interpreted as a measure of mist flammability. The technique provides a rapid and reliable laboratory research tool. (Modified author abstract)

AD-777 023/3GA PC$4.75/MF$1.45
Urs Research Co San Mateo Calif
DEVELOPMENT OF A FLOATING OIL SLICK DETECTOR.
Final rept. fiscal year 1973,
Anthony R. Kriebel. Nov 73, 139p Rept no. URS-7221-11 USCG-D-42-74
Contract DOT-CG-24670-A

Descriptors: *Water pollution, Detectors, Floating bodies, Fuel oils, Spinners, Electrical equipment, Thickness, Oils.
Identifiers: Oil spills, *Oil pollution detection.

The report describes a series of laboratory tests aimed at the initial development of a floating oil slick detector. In principle the detector operates like a viscometer, with a cylinder spinning inside a slightly larger cylindrical shroud partially submerged in the water surface. An oil slick causes the spinner to become coated with oil (rather than water) so that the shaft torque and the electrical current through the drive motor both increase. The increased current can be used to close a relay and thereby signal the presence of floating oil. The test results indicate that all the oil slicks are readily detected by most of the spinner-shroud configurations, and that there is also a limited capability to discriminate the types and thicknesses of oil slicks. (Modified author abstract)

AD-777 056/3GA PC$20.50/MF$1.45
Naval Ship Engineering Center Philadelphia Pa Philadelphia Div
INSTRUMENT STANDARDS. 16TH EDITION,
M. S. Lempa. 1 Jan 71, 350p
See also Edition no. 13, AD-644 371.

Descriptors: *Thermocouples, *Standards, Instrumentation, Wire, Specifications, Installation, Pipes, Connectors, Mechanical components.

The standard presents data and general information concerning thermocouple wire practice at the Naval Ship Engineering Center, Phila., Division.

COM-74-10609/7GA PC$6.50/MF$1.45
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
FREQUENCY DOMAIN MEASUREMENT OF BASEBAND INSTRUMENTATION.
Final rept.,
N. S. Nahman, and R. M. Jickling. Jul 73, 68p
NBSIR-73-330
Sponsored in part by Department of Defense, Redstone Arsenal, Ala.

Descriptors: *Network analysers, Microwave frequencies, Electrical impedance, Oscilloscopes, Sampling, Electric potential, Measurement.

Microwave measurement techniques were developed for characterizing the wideband feed-through sampling heads associated with time domain sampling oscilloscopes and frequency domain network analyzers. Such characterization or modeling is necessary for the removal of the oscilloscope distortion from the observed waveform to yield the input waveform; also, it is useful for extrapolation in estimating oscilloscope performance at higher frequencies. The techniques were developed through measurements on a sampling oscilloscope having a 28 picosecond transition time (10% to 90%) and a 12.4 GHz baseband bandwidth. The major results of the work are the development of voltage and impedance measurement techniques which provide the means for determining the sampling-head equivalent circuit parameters.

COM-74-50211/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
VOLT MAINTENANCE AT NBS VIA 2E/H: A NEW DEFINITION OF THE NBS VOLT.
Final rept.,
B. F. Field, T. F. Finnegan, and J. Toots. 1973, 12p
Pub. in Metrologia, v9 n4 p155-166 1973.

Descriptors: *Standards, *Electrical potential, Measurement, Josephson junctions.

The paper describes in detail the procedures, methods and measurements used to establish a new definition of the U.S. legal volt via the ac Josephson effect. This new definition has been made possible by the use of thin film tunnel junctions (capable of producing 10 mV outputs) and high accuracy voltage comparators. The Josephson junction is used as a precise frequency-to-voltage converter with a conversion factor equalto 2e/h. The adopted value of 2e/h is 483593.420 GHz/V(NBS). The precision (one standard deviation) with which the new unit of emf can be maintained with the present techniques and apparatus is about 2 parts in 10 to the 8th power.

COM-74-50239/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STATISTICAL MODELING AND FILTERING FOR OPTIMUM ATOMIC TIME SCALE GENERATION.
Final rept.,
David W. Allan. 1972, 23p
Pub. in Proceedings of Frequency Standards and Metrology Seminar, Quebec, Canada, 30 Aug-1 Sep 71, p388-410.

Descriptors: *Atomic clocks, *Frequency standards, Calibrating, Frequency stability, Accuracy.

Statistical models for the fractional frequency fluctuations in atomic clocks, clock ensembles, and some of the propagation media are developed. Using these models, near optimum time prediction algorithms are employed to generate time for a clock ensemble or for a set of laboratories' time scales. Accuracy and uniformity problems are considered in light of the June 1970 CCDS recommendations. A model for an evaluable primary frequency standard is developed as well as for a time scale (fly-wheel frequency standard). It is shown that under certain conditions the accuracy of a time scale can be better than the accuracy of the primary standard for the current calibration, if there are a sufficient number of independent past calibrations.

COM-74-50251/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SOME EXPERIMENTAL RESULTS WITH AN ATOMIC HYDROGEN STORAGE BEAM FREQUENCY STANDARD.
Final rept.,
Helmut Hellwig, and Howard E. Bell. 1972, 4p
Pub. in Metrologia, v8 p96-98, 1972.

Descriptors: *Frequency standards, Hydrogen, Masers, Frequency stability, Doppler effect.
Identifiers: Hydrogen masers.

A frequency standard is described in which a quartz crystal oscillator is locked to the hydrogen hyperfine transition using the dispersion of this resonance. The hydrogen storage beam apparatus closely resembles a hydrogen maser with a low-Q cavity below oscillation threshold. Cavity pulling is reduced to a point where environmental temperature fluctuations limit the stability mainly via the second-order Doppler effect. Locking to the dispersion feature of the resonance eliminates the need for frequency modulation in order to find line-center. The stability of the frequency standard was measured against crystal oscillators and cesium beam frequency standards; stabilities of 4 X 10 to the minus 13th power were recorded for sampling times of 30 seconds and of 3 hours.

COM-74-50252/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PERFORMANCE, MODELING, AND SIMULATION OF SOME CESIUM BEAM CLOCKS.
Final rept.,
David W. Allan, D. J. Glaze, H. E. Machlan, A. E. Wainwright, and Helmut Hellwig. 1973, 13p
Pub. in Annual Symposium on Frequency Control, (27th), Philadelphia, Pa., 12-14 Jun 73 p334-346.

Descriptors: *Atomic clocks, *Cesium frequency standards, Mathematical models, Performance evaluation, Comparison.

With the availability of a new primary frequency standard, NBS-5 at the National Bureau of Standards, the authors have been able to evaluate with greater confidence than in the past, the performance characteristics of the commercial cesium beam clocks used in the AT(NBS) atomic time scale. Two other techniques have also been employed to evaluate a clock's performance, viz., interclock comparisons and comparisons with other national laboratories. Using the above performance data they have constructed models for the behavior of cesium beam atomic clocks. Based on these models and appropriate optimization procedures, algorithms have been developed to generate an atomic time scale, AT(NBS). The

model is shown to well fit both individual clocks as well as clock ensembles. This modeling provides a direct opportunity for clock data simulation. Simulation techniques are developed and applied in the testing of some diagnostic tests for frequency and/or time steps. The results are very encouraging as a new effort for even better clock modeling.

COM-74-50253/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
RECENT PROGRESS ON THE NBS PRIMARY FREQUENCY STANDARD.
Final rept.,
D. J. Glaze, Helmut Hellwig, Stephen Jarvis, Jr., A. E. Wainwright, and David W. Allan. 1973, 10p
Pub. in Annual Symposium on Frequency Control (27th) Philadelphia, Pa., 12-14 Jun 73 p347-356.

Descriptors: *Cesium frequency standards, Doppler effects, Frequency stability, Performance evaluation.

The design of NBS-5 is discussed in detail including its relation to previous NBS primary cesium beam frequency standards. The application of pulsed microwave excitation, and the use of frequency shifts with the exciting microwave power in the accuracy evaluation are discussed. Significant changes in the measured atomic velocity distribution with the beam alignment are reported and compared with measured Ramsey patterns. Stabilities of 3 X 10 to the minus 14th power for one day averaging are reported and tentative data on its accuracy capability are given. Preliminary results give an evaluated accuracy of 2 X 10 to the minus 13th power with indications that this figure may be further improved in the future. The bias corrected frequency of NBS-5 agrees to within 1 X 10 to the minus 13th power with the value obtained with NBS-III in 1969 which is preserved in the rate of the NBS Atomic Time Scale.

COM-74-50254/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TIME DOMAIN VELOCITY SELECTION MODULATION AS A TOOL TO EVALUATE CESIUM BEAM TUBES.
Final rept.,
Helmut Hellwig, Stephen Jarvis, Jr., D. J. Glaze, Donald Halford, and Howard E. Bell. 1973, 10p
Pub. in Annual Symposium on Frequency Control (27th) Philadelphia, Pa., 12-14 Jun 73, p357-366.

Descriptors: *Cesium frequency standards, Doppler effect, Phase shift, Cesium electron tubes.

Pulsed excitation of atomic and molecular beam devices with separated Ramsey-type interaction region allows the observation of signals due to very narrow atomic velocity groups. The theoretical background of this method is discussed. Experimental operation of a near mono-velocity cesium beam tube is demonstrated. The velocity distribution of a commercial cesium beam tube and of the primary laboratory standard NBS-5 are obtained using the pulse method.

COM-74-50258/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INFRARED-MICROWAVE FREQUENCY SYNTHESIS DESIGN: SOME RELEVANT CONCEPTUAL NOISE ASPECTS,
Donald Halford. 1972, 36p
Pub. in Proceedings of Frequency Standards and Metrology Seminar, Quebec, Canada, 30 Aug-1 Sep 71, p431-466.

Descriptors: *Frequency standards, *Metrology, Experimental design, Frequency synthesizers, Infrared radiation, Microwaves, Signal to noise ratio.

Extremely accurate and precise frequency synthesis into the infrared and visible radiation regions will allow new vistas of metrology. Frequency and time measurements are the basic operations which will be affected, and impact is expected in such diverse areas as length standards and metrology, spectroscopy, timekeeping, communications and relativistic tests. In addition the set of independent base units of measurement may change, and the speed of light may become a conventional (defined) quantity. The attainment of the desired high accuracy and precision will be easiest and cheapest if there is careful optimization of the synthesis design aspects involving noise. When frequencies in the terahertz region are considered, the linewidth of the signal becomes an important parameter. Due to the low-frequency-divergence of the instability of good signal sources, the concept of the fast linewidth becomes of particular importance. Some of the properties and importance of the fast linewidth in system design are discussed in this paper.

COM-74-50260/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
RECENT PROGRESS ON ATOMIC FREQUENCY STANDARDS.
Final rept.,
R. E. Beehler. 1972, 2p
Pub. in Proceedings of Precision Electromagnetic Measurement Conference, Boulder, Colo., 26-29 Jun 72 p166-167.

Descriptors: *Cesium frequency standards, *Rubidium frequency standards, *Masers, Hydrogen.
Identifiers: *Hydrogen masers.

A brief summary is presented of a paper reviewing progress achieved in the development of atomic frequency standards during recent years. Particular emphasis is placed on cesium, rubidium, and hydrogen maser standards.

COM-74-50261/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE NATIONAL BUREAU OF STANDARDS ATOMIC TIME SCALES: GENERATION, DISSEMINATION, STABILITY, AND ACCURACY.
Final rept.,
David W. Allan, James E. Gray, and H. E. Machlan. 1972, 4p
Pub. in IEEE, Transactions on Instrumentation and Measurement, IM-21 n4 p388-391 Nov 72.

Descriptors: *Atomic clocks, *Cesium frequency standards, *Time standards, Time signals, Synchronism.

The independent atomic time scale at the National Bureau of Standards AT (NBS) is based upon an ensemble of continuously operating cesium clocks calibrated occasionally by an NBS primary frequency standard. The data of frequency calibrations and interclock comparisons are statistically processed to provide nearly optimum time stability and frequency accuracy. The long-term random fluctuation of AT (NBS) due to nondeterministic perturbations is estimated to be a few parts in 10 to the 14th power, and the present accuracy is inferred to be 1 part in 10 to the 12th power. A small coordinate rate is added to the rate of AT (NBS) to generate UTC (NBS): this small addition is for the purpose of maintaining synchronization within a few microseconds of other international timing centers. UTC (NBS) is readily operationally available over a large part of the world via WWV, WWVH, WWVB, and telephone; also via some passive time transfer systems, e.g., Loran-C and the TV line-10 system; and also experimentally via satellite and WWVL. The precision and accuracy of these dissemination systems is discussed.

COM-74-50267/5GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
MICROWAVE ATTENUATION MEASUREMENT SYSTEM (SERIES SUBSTITUTION).
Technical note,
Wilbur Larson, and Eugene Campbell. Feb 74, 29p NBS-TN-647
Paper copy available from GPO $0.35 as C13.46:647.

Descriptors: *Electronic test equipment, Microwaves, Attenuation, Measurement, Attenuators, Electric bridges.

A dual detection microwave bridge circuit has been incorporated in a series substitution system for the measurement of microwave attenuation devices. The use of an optical rotary-vane attenuator in the system yields practical resolution and stability of 0.00005 dB from zero to 30 dB. The dual detection system has several favorable features: (1) it employs a single microwave source which reduces cost, (2) measurements are obtained without power stabilization of the microwave signal source, and (3) this waveguide configuration enables measurements of attenuation devices at any length with minimum of effort and movement of waveguide components. The system configuration is convenient for both attenuation difference, and insertion loss measurements from zero to 70 dB over the WR90 waveguide band of 8.2 to 12.4 GHz. (Author)

COM-74-50308/7GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Time and Frequency Div.
THE STANDARDS OF TIME AND FREQUENCY IN THE U.S.A.
Technical note,
James A. Barnes, and G. M. R. Winkler. Feb 74, 92p NBS-TN-649
Paper copy available from GPO $1.00 as C13.46:649.

Descriptors: *Time standards, *Frequency standards, *United States, Time measurement, Synchronism, Metrology, Federal government, Government policies.

The paper describes the national responsibilities for standards of time and frequency in the U.S.A. The National Bureau of Standards (NBS) and the U.S. Naval Observatory (USNO) are the two organizations chiefly involved in distributing accurate and precise time and frequency information within the U.S.A. The NBS is responsible for the 'custody, maintenance, and development of the national standards' of frequency and time (interval) as well as their dissemination to the general public. The mission of the USNO includes the 'provision of accurate time' for electronic navigation systems, communication, and space technology. This is an integral part of its work concerned with the publication of ephemerides which are used in support of navigation and in the establishment of a fundamental reference system in space. (Modified author abstract)

COM-74-50309/5GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
MASS AND MASS VALUES.
Final rept.,
Paul E. Pontius. Jan 74, 39p NBS-MN-133
Library of Congress Card no. 73-600054.
Paper copy available from GPO $0.70 as C13.44:133.

Descriptors: *Mass, *Metrology, Measurement, Standards, Weight(Mass), Buoyancy, Density(Mass/volume).

There are several bases for assigning mass values to weights to be used as mass standards. As a consequence a given weight may have several assigned mass values depending on the basis used. In many cases, the differences between these assigned values, although easily detectable with precise weighing equipment, are of no practical concern. However, in some instances these differences may be crucial. The first part of this paper is a historical summary of weighing, standards, and the assignment of value; and the interfacing of mass measurements with civilization. The second part of this paper discusses in detail

the methods of assigning mass values. Ways to convert from values on one basis to values on another basis are discussed. Sample problems relating to the buoyant effect of the air are presented in the appendices. (Author)

CONF-710230-1 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
METHOD FOR THE EVALUATION AND CERTIFICATION OF SUPERMICROMETERS.
D. L. Lane, and L. E. Cushing. 7 Jan 71, 14p

Descriptors: (*Measuring instruments, *Accuracy), Design, Interferometers, Lasers, Mechanical efficiency, Tools.

For abstract, see NSA 29 07, number 17962.

ISO-158 PC$3.25/MF$1.45
Isochem Inc., Richland, Wash. (Usa).
FLOWSHEETS FOR HOOD 4 LABORATORY-TYPE HOOD.
L. E. Bruns. 14 Mar 66, 22p
Contract AT(45-1)-2130

Descriptors: (*Laboratory equipment, *Operation), (*Plutonium, *Reprocessing).

For abstract, see NSA 29 07, number 16424.

N74-17156/2GA PC$5.50/MF$1.45
Nebraska Univ., Lincoln. Behlen Lab. of Physics.
INVESTIGATION OF PHOTOELECTRON SPECTROSCOPY.
Final Report.
J. A. R. Samson. Feb 73, 50p NASA-CR-132928
Contract NAS5-23054

Descriptors: *Branching (Physics), *Photoelectrons, *Spectroscopy, Electron distribution, Electron energy, Monochromatic radiation.

For abstract, see STAR 1208

N74-17160/4GA PC$12.75/MF$1.45
Texas Univ., Dallas.
LUNAR ORBITAL MASS SPECTROMETER EXPERIMENT.
Final Report.
W. P. Lord. 15 Sep 71, 193p NASA-CR-134185, DOC-151-070
Contract NAS9-10410

Descriptors: *Apollo 15 flight, *Apollo 16 flight, *Lunar orbiter, *Mass spectroscopy, Fabrication, Performance tests, Reliability engineering, Research and development.

For abstract, see STAR 1208

N74-17166/1GA PC$4.00/MF$1.45
National Aeronautical Lab., Bangalore (India).
THE VARIANCE AS A CRITERION FOR DEFOCUSING IN POWDER DIFFRACTOMETRY.
C. Balasingh, and A. K. Singh. Dec 71, 17p NAL-TN-37

Descriptors: *Diffractometers, *X ray diffraction, Nondestructive tests, Polycrystals, Residual stress.

For abstract, see STAR 1208

N74-17169/5GA PC$5.25/MF$1.45
Cranfield Inst. of Technology (England).
EVALUATION OF THE BASIC PERFORMANCE CHARACTERISTICS OF AN INSTRUMENTATION SYSTEM.
V. Klein. Nov 73, 41p CRANFIELD-AERO-22

Descriptors: *Instruments, *Performance tests, *Systems analysis, *Test equipment, Accuracy, Equipment specifications, Numerical analysis, Reliability analysis.

For abstract, see STAR 1208

N74-17175/2GA PC$4.00/MF$1.45
Interuniversitair Reactor Institut, Delft (Netherlands).
DETERMINATION OF THE DIAMETER OF TWO MONODISPERSE LATEX SPHERES BEPALING VAN DE DIAMETER VAN TWEE MONODISPERSE LATICES.
H. W. J. Bierhuizen, and G. A. Ferron. Nov 73, 9p IRI-190-73-2
Language in Dutch.

Descriptors: *Latex, *Size determination, *Spheres, Accuracy, Aerosols, Diameters, Drop tests, Free fall.

For abstract, see STAR 1208

PAT-APPL-314 053 PC$4.00/MF$1.45
Department of the Air Force Washington D C
TIME DIFFERENTIATING PASSIVE IMPULSE GAGE.
Patent Application,
W. A. Zietzke. Filed 11 Dec 72, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Underground explosions, *Pressure gages, Patents, Nuclear explosions, Ground motion, Impulse loading.
Identifiers: *Patent applications, PAT-CL-73-11.

The patent application relates to a passive impulse gage, having a spring loaded mass responsive to impulses and extraneous loads in nuclear tests. The gage has a locking device to prevent reverse motion of the mass. A scribe mechanism has two spring loaded marking pins for marking a scribe plate. When the motion of the mass stops, the marking wheel is permitted to rotate to move one marking pin out of engagement with the scribe plate and to move the other marking pin into engagement with the scribe plate. Thus the indication due to the test impulse is displaced on the scribe plate from indications due to extraneous loads.

PAT-APPL-453 332 PC$4.00/MF$1.45
Department of Transportation, Washington, D.C.
MAGNETIC GRADIENT VEHICLE DETECTOR.
Patent Application,
Milton K. Mills. Filed 21 Mar 74, 19p DOT/Case-TSC-H-10004
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Detectors, *Patent applications, Magnetic detection, Vehicle detection, Eddy currents, Vehicular traffic.
Identifiers: PAT-CL-31-34.

The patent application relates to an apparatus for detecting metallic objects. In a more limited sense, it relates to a vehicle detection apparatus of the type which senses vehicles by detecting variations in the coupling of a magnetic field between a transmitter and a receiver caused by the induction of eddy currents within the metallic structure of the vehicle. While this apparatus has utility for detecting any metallic object, it has particular utility in the field of vehicle detection for purposes of traffic control, traffic identification and traffic classification.

PATENT-3 195 384 Not available NTIS
Department of the Interior, Washington, D.C.
INCLINED-PISTON DEAD-WEIGHT PRESSURE GAUGE.
Patent,
Donald R. Douslin. Filed 29 Feb 63, patented 20 Jul 65, 7p PAT-APPL-261 913, DOCKET/MIN-584
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure gages, *Patents, Pistons, Precision.
Identifiers: PAT-CL-73-419.

The patent provides a dead-weight pressure gauge comprising an angularly adjustable arrangement in which a weighted element is displaced to counterbalance the force of the pressure applied to be gauged. It provides a precisely accurate pressure gauge apparatus comprising an arrangement of cylindrical elements including a piston driven for rotational and directional displacements therein, on which frictional forces are adjusted to a counterbalance effectuating a null condition in the piston drive for a directional displacement.

PATENT-3 223 319 Not available NTIS
Department of the Interior, Washington, D.C.
MULTIPLE ELECTRODE DETECTOR.
Patent,
George M. Lucich, Julius Rockwell, Jr., and Robert E. Bergstrom. Filed 18 Nov 64, patented 14 Dec 65, 6p PAT-APPL-412 269, DOCKET/FWS-569
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Detectors, *Patents, Electric measuring instruments, Monitors, Fluids, Electrical resistivity, Counters, Fishes.
Identifiers: PAT-CL-235-98.

The patent concerns improvements in an electrical detector and indicator apparatus. More particularly, the improved apparatus operates to derive quantitative information relating to the passage of a substance through a medium confined within a component part of the apparatus by accomplishing a precise monitoring function upon the electrical conductivity of the substance in its association with the component part and an environment established therefor by the medium.

PATENT-3 260 118 Not available NTIS
Department of the Interior, Washington, D.C.
INCLINED-PISTON DEAD-WEIGHT PRESSURE GAUGE. PATENT,
Patent,
Donald R. Douslin. Filed 21 Apr 65, patented 12 Jul 66, 8p PAT-APPL-469 357, DOCKET/MIN-584-A
Previously filed as PAT-APPL-261 913, 28 Feb 63.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure gages, *Patents, Vapor pressure, Pistons.
Identifiers: PAT-CL-73-419.

The patent concerns improvements in a sensitive pressure gauge in which a component force created by the dead weight of a piston structure, brought to an angular displacement from the horizontal, is applied to counterbalance a force on the piston exerted by the pressure of a substance under test. This improved pressure gauge may be adapted to provide very accurate vapor pressure data.

PB-228 121/0GA PC$4.00/MF$1.45
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
STEAM TUNNEL INITIAL OPERATION AND RESULTS.
Technical rept.,
F. G. Hammitt, A. Keller, and G. C. Ernst. Jan 74, 19p UMICH-012449-1-T
Grant NSF-GK-40130

Descriptors: *Test facilities, Steam, Films, Water.
Identifiers: *Steam tunnels.

Preliminary testing of the University of Michigan low pressure wet steam tunnel is reported. It was found that maximum velocity at present is about 1500 f/s giving approximately Mach 1 in the test section. It is expected that modifications and improvements now underway may increase the maximum velocity to about M=1.5. Water films upon blading sections installed in the test section have been induced both by internal cooling of the blade and by injection of water along the blade surface. The behavior and break-up of this film have been observed photographically, along with the droplet size and distribution entrained in the wake. A steam flow separation and reverse flow pattern has been observed along the tapered portion of the blade near the trailing edge. This appears to cause a temporary delay in water film removal, so that the droplet size when removal does occur is increased, thus increasing the erosion problem for downstream moving blades.

PB-230 381/6GA PC$3.25/MF$1.45
Illinois State Dept. of Transportation, Springfield. Bureau of Research and Development.
SKID RESISTANCE OF PAVEMENT MODIFICATION AND CALIBRATION OF THE ILLINOIS SKID TEST SYSTEM.
Interim rept. Mar 70-Apr 72,
Edward J. Kubiak, Philip G. Dierstein, and Floyd K. Jacobsen. Apr 72, 39p RDR-41
See also PB-196 534.

Descriptors: *Test equipment, *Reliability, *Skid resistance, *Pavements, Design standards, Calibration, Illinois.

The skid-test equipment was designed according to the applicable parts of ASTM Designation: E 274-65T, Tentative Method of Test for Skid Resistance of Pavements Using a Two-Wheel Trailer, and construction of the equipment was awarded to a commercial fabricator. After delivery, several modifications were made to improve the overall performance of the original equipment, and calibration procedures were established to insure the reliability of the system. Tests performed with three different methods of water application showed system details and method of water application to have a very significant effect on the magnitude of measured skid resistance and a brush-type applicator to be most effective in depositing a water layer of both uniform width and thickness directly in the path of the test tire.

TID-3338 PC$5.45/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
RADIOMETRIC GAGES. A BIBLIOGRAPHY.
W. H. Kinser. Jan 74, 125p

Descriptors: (*Radiometric gages, *Bibliographies), Densimeters, Fuel gages, Level indicators, Moisture gages, Soils, Thickness gages.

For abstract, see NSA 29 07, number 15772.

14C. Recording Devices

AD-776 657/9GA PC$7.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
AGARD FLIGHT TEST INSTRUMENTATION SERIES. VOLUME 5. MAGNETIC RECORDING OF FLIGHT TEST DATA.
AGARDograph rept.,
G. E. Bennett. Feb 74, 80p Rept no. AGARD-AG-160-Vol-5
See also Volume 4, AD-771 192. NATO furnished.

Descriptors: *Flight testing, *Data acquisition, *Magnetic recording systems, Analog systems, Digital systems, Analog to digital converters, Data processing, Signal processing.

After starting with an assessment of the general requirement for a flight test data acquisition system, following with a general discussion of the complete system, the report is subsequently concerned with some of the more important individual functions of the system--their nature and implementation. The functions selected are those most intimately involved in determining the performance of the system and its efficiency in acquiring the data. In the case of the recording aspects emphasis is placed on the basic recording process, its capabilities and its problems, and on the techniques necessary to overcome its shortcomings. Basic design principles of airborne tape transports and the characteristics of write/read heads and magnetic tape are also discussed. The report concludes with a discussion of the problems involved in specifying a requirement for a flight test data acquisition system and with comments on the likely nature of future systems.

N74-17161/2GA PC$4.75/MF$1.45
IIT Research Inst., Chicago, Ill.
FEASIBILITY MODEL OF A HIGH RELIABILITY FIVE-YEAR TAPE TRANSPORT, VOLUME 1.
Final Technical Report, 5 Jan. 1972-5 Nov. 1973.
R. L. Eshleman, A. P. Meyers, W. A. Davidson, R. C. Gortowski, and M. E. Anderson. Oct 73, 33p NASA-CR-132901
Contracts NAS5-21692, IITRI PROJ. E6225

Descriptors: *Magnetic tapes, *Reliability analysis, *Satellite-borne instruments, *Tape recorders, Performance tests, Reels, Structural reliability, Systems engineering.

For abstract, see STAR 1208

N74-17162/9GA PC$8.75/MF$1.45
IIT Research Inst., Chicago, Ill.
FEASIBILITY MODEL OF A HIGH RELIABILITY FIVE-YEAR TAPE TRANSPORT. VOLUME 3: APPENDICES.
Report for 5 Jan. 1972 - 5 Nov. 1973.
A. P. Meyers, W. A. Davidson, and R. C. Gortowski. Oct 73, 112p NASA-CR-132904
Contracts NAS5-21692, IITRI PROJ. E6225

Descriptors: *Magnetic tapes, *Reliability analysis, *Satellite-borne instruments, *Tape recorders, Computer programs, Electronic control, Engineering drawings, Stress concentration, Systems engineering.

For abstract, see STAR 1208

PATENT-2 804 506 Not available NTIS
Department of the Interior, Washington, D.C.
DYNAMAGNETIC PICK-UP SYSTEM.
Patent,
Edward C. Schurch, and Ferber R. Schleif. Filed 31 Oct 51, patented 27 Aug 57, 5p PAT-APPL-254 184,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Magnetic heads, *Patents, Magnetic recording, Magnetic tapes.
Identifiers: PAT-CL-179-100-2.

The patent relates to means for the translation of intelligence from a magnetic record.

PATENT-2 879 472 Not available NTIS
Department of the Interior, Washington, D.C.
DYNAMIC RESISTANCE RECORDER.
Patent,
Edgar C. Worden. Filed 11 Oct 57, patented 24 Mar 59, 3p PAT-APPL-689 689, DOCKET/MIN-229
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Recording instruments, *Patents, Electrical resistance, Resistance bridges, Load impedance, Melts.
Identifiers: PAT-CL-324-62.

The patent provides a system for continuously measuring the resistance of a changing electrical load. It provides a circuit including a self-balancing bridge wherein the voltage in one arm is proportional to the voltage across the load, and the current in an adjacent arm is proportional to the current through the load.

14E. Reprography

AD-776 369/1GA PC$4.00/MF$1.45
Stanford Research Inst Menlo Park Calif
DEVELOPMENT OF A PSYCHOPHYSICAL PHOTO QUALITY MEASURE.
Research rept.,
F. R. Clarke, R. I. Welch, and T. E. Jeffrey. Jan 74, 81p ARI-RR-1178
Contract DAHC49-092-ARO-169

Descriptors: *Photointerpretation, *Photographic images, *Quality, *Terrain intelligence, Photographic scale, Photointerpretability, Resolution, Aerial photography.

In extracting information from aerial reconnaissance/sensor products, the image interpreter must often work with imagery of less than ideal quality. The Surveillance Systems research program of the Army Research Institute is designed to identify factors of photo quality that can help measure the interpretability of operational imagery. In the present experiment, image scale, atmospheric haze, and image motion were judged to be key factors in operational interpretability of imagery. Laboratory manipulation of representative operational images produced experimental images with controlled degradation of these three factors, separately and in combination. Image interpreters were asked to detect and identify military targets on this degraded imagery. Their scores were used to assess interpretability as a function of scale, haze, and image motion. In a parallel experiment, geometric shapes were positioned on background panels of black, white, and grey. Photographs of this array were degraded with respect to scale, haze, and image motion to the same levels as the first experimental imagery, and similar tests were conducted. (Modified author abstract)

AD-776 552/2GA PC$3.00/MF$1.45
Naval Training Equipment Center Orlando Fla
INVESTIGATION OF CINEHOLOGRAPHIC SYSTEM CHARACTERISTICS. I. THEORETICAL TREATMENT OF SPECIAL HOLOGRAPHIC TECHNIQUES USED IN CINEHOLOGRAPHY.
Final rept. Oct 72-Jul 73,
William C. Oelfke. Jan 74, 25p* Rept no. NAVTRAEQUIPC-IH-215

Descriptors: *Motion picture photography, *Holography, Theory, Motion picture film, Resolution, Motion picture cameras, Motion picture projectors, Lenses.
Identifiers: *Cinéholography.

The investigation compares the cinéholographic display technique using large condensing lenses to expand the viewing area to that using the fly's-eye lenslatic array. It is found that for either system the film positioning tolerance is approximately 1/4 the lens or lenslet diameter. Refinemnets in the condensing lens technique are suggested and a 35 mm cinéholographic projector is proposed. (Author)

AD-776 962/3GA PC$4.00/MF$1.45
Beeman Engineering Associates Inc Boonton N J
COST BENEFITS STUDY - INTERIM 16MM MICROFILM CONTAINER AND REEL ASSEMBLY.
Interim rept. no. 5,
H. A. Barton. 10 Mar 74, 90p EDS/R-27U
Contract DAAA21-72-C-0515

Descriptors: *Microfilm, *Containers, *Cost analysis, *Military procurement, Standardization, Inventory control, Data storage systems, Logistics, Military equipment, Surveys.
Identifiers: Benefit cost analysis.

The report provides technical, operational and cost information relative to the procurement and use by the government of the DoD Interim 16MM Microfilm Container and Reel Assembly. (Author)

N74-17158/8GA PC$12.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
FEASIBILITY TEST OF A SOLID STATE SPIN-SCAN PHOTO-IMAGING SYSTEM.
N. P. Laverty. 14 Dec 73, 192p NASA-CR-114733, TRW-23671-6001-TU-00
Contract NAS2-7592

Descriptors: *Imaging techniques, *Spaceborne photography, *Spin-orbit interactions, Feasibility analysis, Signal analysis, Signal to noise ratios, Spatial filtering, Transfer functions, Video equipment.

For abstract, see STAR 1208

N74-17159/6GA PC$5.25/MF$1.45
State Univ. of New York, Stony Brook. Dept. of Earth and Space Sciences.
UV PHOTOGRAPHY OF THE EARTH AND THE MOON.
Final Report, 1 Mar. 1971 - 30 Sep. 1973.
30 Sep 73, 45p NASA-CR-134189
Contract NAS9-11640

Descriptors: *Earth (Planet), *Moon, *Photointerpretation, *Ultraviolet photography, Imaging techniques, Mars surface, Planetary surfaces, Venus (Planet).

For abstract, see STAR 1208

N74-17163/8GA PC$4.50/MF$1.45
CBS Labs., Stamford, Conn.
THE APPLICABILITY OF FRAME IMAGING FROM A SPINNING SPACECRAFT. VOLUME 1: SUMMARY REPORT.
R. A. Botticelli, R. O. Johnson, and G. N. Wallmark. 30 Jun 73, 29p NASA-CR-114637
Contract NAS2-7101

Descriptors: *Framing cameras, *Imaging techniques, *Spaceborne photography, *Spin stabilization, Image transducers, Outer planets explorers, Stabilized platforms, Vidicons.

For abstract, see STAR 1208

N74-17164/6GA PC$19.75/MF$1.45
CBS Labs., Stamford, Conn.
THE APPLICABILITY OF FRAME IMAGING FROM A SPINNING SPACECRAFT. VOLUME 2: TECHNICAL REPORT.
R. A. Botticelli, R. O. Johnson, and G. N. Wallmark. 30 Jun 73, 333p NASA-CR-114638
Contract NAS2-7107

Descriptors: *Framing cameras, *Imaging techniques, *Spaceborne photography, *Spin stabilization, Image transducers, Outer planets explorers, Stabilized platforms, Vidicons.

For abstract, see STAR 1208

PATENT-3 752 556 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
REAL TIME MOVING SCENE HOLOGRAPHIC CAMERA SYSTEM.
Patent.
R. L. Kurtz. Patented 14 Aug 73, 11p NASA-CASE-MFS-21067-1,
Misc-Filed 2 Jun. 1971.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Cameras, *Holography, *Motion pictures, *Real time operation, Light transmission, *Patents, Systems engineering.

A holographic motion picture camera system producing resolution of front surface detail is described. The system utilizes a beam of coherent light and means for dividing the beam into a reference beam for direct transmission to a conventional movie camera and two reflection signal beams for transmission to the movie camera by reflection from the front side of a moving scene. The system is arranged so that critical parts of the system are positioned on the foci of a pair of interrelated, mathematically derived ellipses. The camera has the theoretical capability of producing motion picture holograms of projectiles moving at speeds as high as 900,000 cm/sec (about 21,450 mph).

15. MILITARY SCIENCES

15A. Antisubmarine Warfare

AD-776 801/3GA PC$5.00/MF$1.45
Ohio State Univ Research Foundation Columbus
THE ANALYSIS OF TACTICS.
Final rept. 1 Apr 72-30 Sep 73,
Daniel Howland, Henry D. Colson, and Charles R. McLean. 19 Sep 73, 166p
Contract N00014-67-A-0232-0017

Descriptors: *Hunter-killer groups, *Tactical warfare, *Management planning and control, Mathematical models, Task forces, Cybernetics, Missions, Time series analysis, Undersea warfare.
Identifiers: *Cybernetic models.

The report describes a method for analyzing ASW submarine tactics, which is based on the view that the behavior of the ASW submarine is adaptive; i.e., that it is goal-directed, complex, information-dependent, resource-limited, and influenced by both the internal and external environments. Systems exhibiting these dynamic characteristics may be represented by cybernetic models, and their behavior understood in terms of interactions between information and resource flow. This method of analysis is designed to answer three major questions: (1) What resources are used to accomplish assigned tasks and missions; (2) how are the resources used; and (3) to what extent do different resource mixes influence the time and cost of task and mission accomplishment. The method can be used in non-military situations also. (Modified author abstract)

15C. Defense

AD-776 350/1GA PC$8.75/MF$1.45
Stanford Research Inst Menlo Park Calif
EMERGENCY OPERATIONS SYSTEMS DEVELOPMENT: CIVIL DEFENSE RESCUE PHASE II.
Final comprehensive rept.,
Lacy C. Thomas, and James F. Mahar. Nov 67, 111p
Contract OCD-PS-65-62

Descriptors: *Emergencies, *Civil defense, Attack, Operations research, Rescues, Mobilization, Shelters, Logistics support, Readiness.

The major purpose of the Phase II rescue task was to redefine the rescue function in terms of a broad lifesaving role so that the bases for guidance materials for local governments would be fully supported by these findings. The report deals with the attack environment, base for rescue, rescue operations, supporting services, program elements, and rescue force acquisition.

AD-776 382/4GA PC$5.75/MF$1.45
Human Sciences Research Inc Mclean Va
AREA-WIDE DISASTER RESPONSE: CIVIL PREPAREDNESS AND REGIONAL COUNCILS.
Final rept. Dec 72-Mar 74,
Robert J. Marshak. Feb 74, 204p Rept no. HSR-RR-74/1-Px
Contract DAHC20-73-C-0125

Descriptors: *Civil defense, *Disasters, Evacuation, Regions, Preparation, Urban planning, Operations research.
Identifiers: A 95 reviews.

The report is divided into three parts which describe: The development of regional councils and the A-95 Review Process; a regional approach to preparedness planning and organization which would allow the preparedness community to utilize regional councils effectively; and the general planning requirements that would be posed by a crisis relocation, with an indication of how a regional preparedness orientation would support such a contingency planning effort. The major recommendations of the report include: The establishment of a regional collegium of preparedness Directors and the funding of a professional planner or administrator to work with the collegium and regional councils; the encouragement of regional councils to contact preparedness officials as part of the A-95 PNRS; the funding, by DCPA, of area-wide comprehensive preparedness plans; and the incorporation of crisis relocation planning within a larger comprehensive planning effort utilizing regional councils to encourage multi-jurisdictional and multi-agency involvement. (Author)

AD-776 512/6GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PROTECTION OF CIVIL DEFENSE EQUIPMENT IN CONDITIONS OF A NUCLEAR WAR.
O. Cherobokov. 5 Nov 73, 8p Rept no. FSTC-HT-23-1082-70
Trans. of unidentified Russian language article.

Descriptors: *Civil defense, *Equipment, Maintenance, Nuclear warfare, Translations, USSR.

The document gives a response to the question on how to protect civil defense equipment in the condition of nuclear war. Various methods and types of equipment are used to solve the problems of civil defense in order to avoid massive losses of equipment and vehicles in a nuclear war. (Author)

AD-776 896/3GA PC$3.25/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
NIGHT RECONNOITERING CAPABILITY FOR MILITARY DOGS.
Final rept.,
E. Scott Tomlinson, and M. Krauss. Apr 74, 27p Rept no. LWL-74-54

Descriptors: *Army personnel, *Night vision, *Goggles, *Perimeters(Defense), Dogs, Night vision devices, Image intensifiers(Electronics), Locators.
Identifiers: AN/PVS-5.

The AN/PVS-5 Night Vision Goggles were evaluated as a potential viewing device to enable a military dog handler to work his dog, e.g., a scout dog, off-leash at night. Supplementary IR illuminating devices mounted on the dog were evaluated in conjunction with the AN/PVS-5, but were proved to be unnecessary at distances up to 50 meters. Since 50 meters is the maximum distance at which an off-leash dog would be allowed to operate, the AN/PVS-5 NV Goggles alone are adequate to enable the handler to work his dog. A radio-controlled omnidirectional IR indicator light was evaluated and proved to be useful in enabling a handler to locate his dog in darkness if it is momentarily lost to view. (Author)

AD-911 119/6GA PC$6.25/MF$1.45
Army War Coll., Carlisle Barracks, Pa.
THE IMPACT OF WEAPONS TECHNOLOGY ON MILITARY STRATEGY.
Research rept.,
Jimmy L. Jones. 21 Mar 73, 61p
Distribution Limitation now Removed.

Descriptors: *Tactical weapons, Military strategy, Armed forces(United States), USSR, Threat evaluation, Advanced planning, Military requirements, Penetration aids, Deterrence, Limited war, Countermeasures, Nuclear weapons, Operational readiness, Armed forces research, Advanced weapons.
Identifiers: National security, Nonnuclear weapons, Balance of power.

In evaluating the influence of weapon technology on military strategy, the paper discusses three factors: Soviet threat and challenge to free world security; U.S. concept of deterrence; and the Soviet and U.S. views of limited war. It concludes that America must not become apathetic, but maintain its technological superiority over the Soviet Union. Further, that in order to counter 'National wars of liberation,' consideration should be given to developing more effective conventional weaponry, while at the same time sustaining the much needed sophisticated deterrent nuclear forces in-being. (Modified author abstract)

AD-914 312/4GA PC$7.00/MF$1.45
R and D Associates, Santa Monica, Calif.
MIDCOURSE DEFENSE CONCEPTS. VOLUME III. SYSTEM CONFIGURATION AND FEASIBILITY OF AN X-RAY SENSOR FOR EXO-ATMOSPHERIC USE.
Final technical rept. 15 Mar -30 Jun 73,
J. Sanborn. Aug 73, 80p RDA-TR-2403-003
Contract DAHC-0-72-C-0123
See also report AD-527 776. Distribution Limitation now Removed.

Descriptors: *Antimissile defense systems, *Optical tracking, *Target discrimination, *X rays, *Guided missile detection, *Advanced weapons, X-ray tubes, Reentry vehicles, Decoys, Electrons, Compton scattering, Balloons, Lasers, Bremsstrahlung, Scintillation, Interactions, Atmosphere, Feasibility studies, Gamma rays, Exosphere, Transmitter-receivers, Electron beams, Absorption, Background, Sun, Sensors.
Identifiers: *Midcourse defense, X ray lasers, X ray radar.

The feasibility of exo-atmospheric discrimination of replica balloon decoys from reentry vehicles by means of an x-ray sensor system in a midcourse defense (MCD) context is analyzed. The discrimination relies on the fact that a replica decoy will contain less electrons than a reentry vehicle (RV) and thus if these objects are subjected to a flux of high energy x-rays, the compton scattered radiation will be at least an order of magnitude greater for the RV. A first-order analysis and modeling of the system is performed, and the resulting expected performance is presented. Due to the characteristic distance and time parameters imposed by the MCD context, it is found to be unfeasible at the present time. (Author)

15D. Intelligence

AD-776 387/3GA PC$13.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
TERRAIN ANALYSIS FOR THE ARMORED RECONNAISSANCE SCOUT VEHICLE TEST PROGRAM.
Rept. for Dec 72-Oct 73,
D. D. Randolph, and C. A. Blackmon. Mar 74, 207p

Descriptors: *Terrain intelligence, *Armored vehicles, *Mobility, Mapping, Terrain models, Reconnaissance, Surveillance, Aerial photographs, Soil mechanics, Trafficability.

Two study areas totaling approximately 11 sq miles, were selected at Fort Knox, Kentucky, for comparison with a previously mapped 60-sq-mi sample of terrain in West Germany and as potential areas for field tests with the prototype Armored Reconnaissance Scout Vehicles and comparison vehicles. Areal and linear terrain data from 119 sites, aerial photographs, and other pertinent information were used to prepare the Fort Knox terrain factor complex maps. These areal maps describe the terrain characteristics that affect vehicle performance, i.e. soil type, soil strength, topographic slope, obstacles, vegetation, surface roughness, and visibility. The linear terrain factor complex maps describe the terrain characteristics that determine 'go or no-go' vehicle performance, i.e. linear feature geometry, water depth, and water velocity.

15E. Logistics

AD-776 383/0GA PC$6.75/MF$1.45
Naval Postgraduate School Monterey Calif
AN INVESTIGATION OF VARIABLE OPERATING AND SAFETY LEVEL (VOSL) STOCKING AND FUNDING POLICY.
Master's thesis,
Richard Earl Lewis, and Robert Darol Perkins. Mar 74, 72p

Descriptors: *Inventory control, *Naval equipment, Computerized simulation, Management planning and control, Finance, Replenishment, Mathematical models, Computer programs, Theses.
Identifiers: VOSL(Variable Operating and Safety Level), Variable operating and safety level.

Control in the management of stocks of retail material (DSA) at Navy stock points is exercised through a centrally administered stocking policy model (VOSL) and funding policy. The dynamic behavior of these controls operating on a stock point was investigated by computer simulation. The simulation results indicate that under the most favorable circumstances, the value of resupply orders directed by the VOSL stocking model exceeded the grants made by the funding policy. Under less favorable, more realistic conditions, the difference between funding requirements and funding grants is more marked and supply performance degrades very significantly over time. (Modified author abstract)

AD-776 539/9GA PC$4.50/MF$1.45
Naval Postgraduate School Monterey Calif
AUDITING COST-EFFECTIVENESS ANALYSES OF TECHNOLOGICAL CHANGES.
Final rept. Apr 72-Nov 73,
James K. Hartman, and N. K. Womer. Nov 73, 105p Rept no. NPS-55HH73121A

Descriptors: *Naval aircraft, *Maintenance, *Cost effectiveness, Inventory control, Jobs, Production, Linear programming, Economic models, Statistical analysis.
Identifiers: WIPICS(Work In Process Inventory Control System), Work in process inventory control system, Production functions, Naval Air Rework Facilities.

A methodology is developed for auditing cost effectiveness analyses of major technological changes. The methodology is applied to the Work in Process Inventory Control System (WIPICS) recently implemented at NARF, North Island. The approach involves using data on NARF operations to estimate cost functions for each major program of the NARF both before and after the change. Cost comparisons using these models do not show a clear cost savings for the WIPICS system. (Author)

AD-776 781/7GA PC$8.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN ECONOMIC ANALYSIS OF THE RELEVANT COSTS IN AIR FORCE BUILDING REPLACEMENT.
Master's thesis,
Melville M. Andrews, Jr., and Jack L. Joines. Jan 74, 104p Rept no. SLSR-17-74A

Descriptors: *Air force facilities, *Buildings, *Cost analysis, *Replacement, Costs, Maintenance, Construction, Mathematical analysis, Theses, Life expectancy.
Identifiers: Present worth, Depreciation.

The thesis describes and analyzes the relevant costs in an Air Force building replacement consideration and illustrates, through the use of economic analysis, the effects of the described relevant costs on the replacement decision. A regression analysis is accomplished to illustrate a method of predicting maintenance expenditures. Building deterioration, obsolescence, and effectiveness are discussed in terms of their effects on maintenance costs and performance of the assigned function. An economic analysis of a hypothetical replacement consideration illustrates the sensitivity of the replacement decision to inclusion of the costs of obsolescence and reduced functional performance. Deferred maintenance is assessed in terms of its effect on functional performance. (Modified author abstract)

AD-776 790/8GA PC$4.00/MF$1.45
Air Force Academy Colo
PROJECT 'P.O.L.': OPTIMIZING PROCUREMENT OF AVIATION FUELS FOR DEFENSE SUPPLY AGENCY - NETWORK GENERATING ALGORITHM (NGA).
Final rept.,
Michael W. Gaffney. Jan 74, 95pp Rept no. USAFA-TR-74-1

Descriptors: *Aviation fuels, *Military procurement, Network flows, Linear programming, Computer programs, Transportation, Optimization, Algorithms.
Identifiers: POL project.

A new optimization package has been developed which casts the Defense Supply Agency POL bid award problem in terms of a network formulation. The problem is viewed as a collection of nodes which represent the oil companies, government storage terminals, and military installations, and arcs which represent the transportation net connecting these physical locations. The required input to the optimization package is the precise description of the nodes and arcs in the network. The report describes an algorithm which develops a network description based on currently structured DSA data files. (Author)

AD-776 823/7GA PC$4.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
FORECASTING TRANSPORTATION TONNAGE BY AN ADAPTIVE SMOOTHING MODEL.
Francis E. James, Jr. Dec 73, 26p Rept no. AU-AFIT-SL-10-73

Descriptors: *Air transportation, *Cargo, Mathematical prediction, Logistics planning, Forecasting, Air Force, Mathematical models, Lead time, Least squares method, Regression analysis.
Identifiers: Smoothing(Mathematics).

The paper describes a research project which was designed to investigate the feasibility of using mathematical models to forecast cargo air shipments. Seven mathematical models were evaluated. In a two phase research effort, actual movement through eight routes over forty-one months was first evaluated according to six different criteria for six forecasting models. Parameters were varied for the models to approach optimality. Using results from the first phase, three models were re-evaluated through thirty-nine routes for thirty-six months each. An adaptive exponential

model was identified as being most suitable for the contemplated usage. (Author)

AD-776 938/3GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
GUIDELINES FOR PREPARING ECONOMIC ANALYSIS FOR ARMY AIRCRAFT PRODUCT IMPROVEMENT PROPOSALS.
Final rept.,
Anthony G. Kassos, Jr. Mar 74, 23p Rept no. USAAVSCOM-TR-74-18

Descriptors: *Army aircraft, *Procurement, *Cost analysis, Logistics, Cost effectiveness, Savings, Safety.
Identifiers: Product improvement proposals.

The report contains the text of a presentation given by the AVSCOM Cost Analysis Division on 8 January 1974 to representatives from the various Directorates and Project Management Offices of AVSCOM. The purpose of the presentation was to provide AVSCOM Produce Improvement Proposal (PIP) proponents with guidelines in preparing the economic analysis required for FY 76 PIP submittals to AMC. This report addresses all available guidance as of this date. It is intended as an introduction to economic analysis for the PIP proponent who is unfamiliar with this discipline, but must prepare an analysis for his PIP submission. (Author)

AD-776 972/2GA PC$5.00/MF$1.45
General Research Corp Mclean Va Operations Analysis Div
A METHODOLOGY FOR DEVELOPING ALTERNATIVE CONSOLIDATION AND CONTAINERIZATION POINT LOADING POLICIES.
Final rept.,
John A. Scanga, Armand A. Bilodeau, and William C. Koch. Feb 74, 161p Rept no. OAD-CR-29
Contract DAHC19-69-C-0017

Descriptors: *Supply depots, *Army equipment, *Logistics, Military facilities, Inventory control, Vans, Pallets, Spatial distribution, Computerized simulation, Computer programs, FORTRAN.
Identifiers: FORTRAN 4 programming language, CDC 6400 computers.

The report evaluates alternative loading policies and distribution plans for implementation by the New Cumberland Army Depot Consolidation and Containerization Point (CCP). A model, written in FORTRAN 4 and currently operational on a Control Data Corporation 6400, simulating the CCP is described. Results of analyses of model outputs and other data are also presented in the report. (Modified author abstract)

PAT-APPL-310 837 PC$4.00/MF$1.45
Department of the Air Force Washington D C
AIR FLOATATION CARGO HANDLING SYSTEM.
Patent Application,
J. J. Weingarten. Filed 28 Nov 72, 19p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Pallets, *Inflatable structures, Patents, Cargo aircraft, Cargo, Air cushion vehicles.
Identifiers: *Patent applications, PAT-CL-244-137.

The invention relates generally to a cargo aircraft-load-handling system in which unique flexible and inflatable means are used to float cargo carrying containers or pallets on the cargo compartment floor of a cargo aircraft.

15G. Operations, Strategy, and Tactics

AD-776 355/0GA PC$3.00/MF$1.45
Army Natick Labs Mass
OPTIMAL CONTROL OF A GLIDING PARACHUTE SYSTEM.
Technical rept.,
Allan E. Pearson. Aug 72, 25p Rept no. USA-NLABS-TR-73-30-AD

Descriptors: *Aerial delivery, *Parachutes, *Control theory, Weapon systems, Optimization, Gliding.

The optimal control of a gliding parachute system descending at a constant rate is considered for the problem of minimizing the terminal distance from the target at touchdown. Utilizing the parachute bank angle as a control variable, two formulations are presented for the constrained and unconstrained control variable cases, each of which requires the solution to a nonlinear two point boundary value problem. Using the free descent path of the parachute as a nominal solution, a suboptimal feedback control law is derived which approximates the solution to the unconstrained control variable cases. This control law requires an estimate of the wind vector, as well as measurements of the position and velocity of the parachute relative to the target and air respectively. (Author)

AD-776 632/2GA PC$3.00/MF$1.45
Florida Univ Gainesville Dept of Industrial and Systems Engineering
DEFENDING A LOGISTICS SYSTEM UNDER MINING ATTACK.
Research rept.,
Peter Bartow McWhite, and H. Donald Ratliff. Feb 74, 24p Rept no. RR-74-2
Contract N00014-69-A-0173-0017
Prepared in cooperation with Center for Naval Analyses, Arlington, Va.

Descriptors: *Mine countermeasures, *Logistics support, *Naval logistics, Mine warfare, Mathematical models, Logistics planning, Optimization, Deployment, Military supplies, Mine-laying aircraft, Minelaying equipment.
Identifiers: *Logistics management.

A fundamental problem in mine warfare defense is to deploy mine countermeasure resources and to route supplies so that shipping losses are minimized. The shipping losses at a port are a function of the mining attack, the quantity and duration of countermeasure efforts, and the amount shipped from the port. Models and solution algorithms are developed in this paper to optimally apportion scarce countermeasure resources when the quantity of supplies shipped out of each port is not subject to control and for the case when one can control both flow routing and countermeasures deployment. When the shipping schedule is fixed, the models are special cases of minimum cost network flow problems. For the more general problem, an enumeration algorithm is developed and computational results presented. (Author)

AD-776 898/9GA PC$3.75/MF$1.45
Army Natick Labs Mass
MILITARY POTENTIAL TEST OF INTERIM HIGH LEVEL CONTAINERS AIRDROP SYSTEM (HLCADS).
Final rept.,
Edward J. Barnicle. Nov 73, 53p Rept no. USA-NLABS-TR-74-23-AD

Descriptors: *Air drop operations, *Containers, Aerial delivery, Parachute descents, Cutters, Flight testing, Parachutes, Logistics.
Identifiers: HLCADS(High Level Container Airdrop Systems), High level container airdrop systems, Ballistic cutters.

The U. S. Army Natick Laboratories and the U. S. Army Airborne, Communications and Electronics Board, Fort Bragg, N. C., conducted an airdrop test on the Interim High Level Container Airdrop System for the purpose of determining the suitability of using a Confine Ballistic Cutter in a Two Stage Configuration. (Author)

AD-776 900/5GA PC$8.00/MF$1.45
Stanford Research Inst Menlo Park Calif
A METHOD FOR ESTIMATING THE SENSITIVITY OF COMBAT EFFECTIVENESS TO COUNTERSURVEILLANCE MATERIEL USE: AN APPLICATION OF RISK ANALYSIS.
Final technical rept.,
George G. Barnes, and Nancy A. David. Feb 74, 100p Rept no. SRI-2505-1
Contract DAAK02-73-C-0216

Descriptors: *Counterintelligence, *Army equipment, *Confidence limits, Army personnel, Decision making, Tactical warfare, Risk, Logistics.
Identifiers: *Risk analysis.

A method for estimating the sensitivity of combat effectiveness to countersurveillance materiel use is developed by analyzing the decision of an employing commander who is considering the sequence of events that will follow his countersurveillance materiel-use decision. These events are: The altering of information delivered to an enemy commander from his surveillance system because of the countersurveillance effort; the enemy commander's force employment decision based, in part, on this altered information; the engagement outcome given the relative force employments that have ensued. The relation of the commander's decision to his multicomponent risk tolerance is portrayed. The effectiveness of candidate countersurveillance materiel is estimated, along with examples of two types of supporting mathematical simulations. (Modified author abstract)

AD-915 151/5GA PC$6.25/MF$1.45
Franklin Inst. Research Labs., Philadelphia, Pa.
MODEL STUDY OF INSTANT VEHICULAR CAMOUFLAGE.
Final rept.,
Peter Bressler, and John A. Debenedictis. Oct 73, 65p FIRL-F-C3547-5 LWL-CR-21C73
Contract DAADO5-73-C-0140
Distribution Limitation now Removed.

Descriptors: *Camouflage, Military vehicles, State of the art, Reviews, Feasibility studies, Distortion, Deception, Foliage, Coatings, Colors, Paints, Plastics, Decoys, Wire, Terrain, Surface targets, Models, Inflatable structures, Reflectors, Carbon dioxide, Cartridges, Trees, Plants(Botany), Tanks(Combat vehicles), Deployment, Fluorescence, Liquid crystals, Fresnel lens, Optical images, Acoustics, Holography.
Identifiers: *Instant camouflage, Infrared paints, Foam nets, Plastic foliage kits, Spring loaded foliage, Wire nets.

A feasibility study is presented to determine what materials and geometric systems would be required for fabrication of a camouflage system that would instantaneously cover a military vehicle in order to disrupt its characteristic shape or outline. The program involved intensive research and field trips in which the state-of-the-art of modern camouflage was studied; conception of numerous camouflage systems from the research and group synetics process; production of prescribed models and diagrams; and analysis of systems and conclusions as to their feasibility. (Author)

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

AD-776 324/6GA PC$6.25/MF$1.45
Army Missile Command Redstone Arsenal Ala Guidance and Control Directorate
DIGITAL COMPUTER PROGRAMS FOR THE ANALYSIS OF DIRECTIONALLY CONTROLLED MISSILES.
Technical rept.,
W. Curtis Brown. 5 Dec 73, 65p Rept no. RG-73-33

Descriptors: *Guided missile trajectories, *Computer programs, Digital simulation, Control

theory, Terminal guidance, Numerical analysis, FORTRAN.
Identifiers: FORTRAN 4 programming language.

In the system analysis of directionally controlled missiles, much time is spent determining the system parameters to give an optimum trajectory and the determination of missile accuracy. The purpose of the report is to document two digital simulation programs, written in FORTRAN 4, which were developed to accomplish these tasks. The report is written to provide as much help as possible to prospective users and with the assumption that the prospective users have a theoretical knowledge of directionally controlled missile guidance and control systems. (Author)

16C. Missile Warheads and Fuses

AD-776 374/1GA PC$7.25/MF$1.45
Tennessee Univ Space Inst Tullahoma
A THEORY FOR SUBSONIC AND TRANSONIC FLOW OVER A CONE - WITH OR WITHOUT SMALL YAW ANGLE.
Technical rept.,
Jain-Ming Wu, and Robert C. Lock. Dec 73, 85p RD-74-2
Contract DAAH01-71-C-1078

Descriptors: *Reentry vehicles, *Conical bodies, *Pressure, Mathematical models, Distribution, Surface reactions, Subsonic characteristics, Transonic characteristics, Angle of attack, Theory, Equations of motion, Transformations(Mathematics), Iterations, Computations.

The primary purpose was to develop an accurate method of calculating the surface pressure distribution over a conical forebody for a wide range of free-stream Mach numbers including subsonic, transonic, and low supersonic flow. The theoretical approach used was similar to one previously proposed by Wu and Aoyama. The nondimensionalized small disturbance transonic flow equation was linearized to a variable coefficient elliptic form. A transformation was introduced to further reduce the governing equation to a Laplace form, which yields an integral equation for the transformation function. A first-order solution was obtained by an iterative procedure. The effect due to the small angle of attack has been included by adding the linearized cross flow contribution. (Modified author abstract)

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-901 236/0GA PC$14.25/MF$1.45
Bose Corp., Natick, Mass.
FINAL STUDY AND DEVELOPMENT REPORT OF HIGH EFFICIENCY SONAR TRANSMITTERS.
Final rept. 15 Jun 70-1 Jun 72,
Joseph L. Veranth. 1 Jun 72, 225p 1303-002F
Contract N00024-70-C-1303
Distribution Limitation now Removed.

Descriptors: (*Sonar projectors, *Audio amplifiers), (*Power amplifiers, Sonar projectors), (*Transistor amplifiers, Sonar projectors), Electronic switches, Semiconductor devices, Inverters, Modulation, Control, Electric currents, Logic circuits, Switching circuits, Feedback, Linear systems, High frequency, Impedance matching, Thyratrons.
Identifiers: *Switching amplifiers, Thyristors.

The basic issues of high-power audio-frequency amplification are reviewed. A study of a class of high-frequency switching sonar transmitters is presented. Basic design considerations for linear, baseband, switching, and high-frequency switching amplifiers are discussed. The application of presently available solid state devices to power amplification is considered. System and circuit considerations lead to the development of the current-controlled two-state modulation system. The operation of the current-controlled two-state modulation system as an audio power amplifier is analyzed. System characteristics are related to design parameters, and the design of a 1000 VA, 3.5 KHz amplifier is presented. A 500 VA breadboard circuit is used to evaluate this concept. A 1000 VA, 3 KHz current-controlled three-state brassboard amplifier is constructed and tested. (Modified author abstract)

AD-911 523/9GA PC$7.25/MF$1.45
TRACOR, Inc., Austin, Tex.
COMPUTER AIDED DETECTION FOR WIDEBAND PASSIVE SONAR SYSTEMS.
Final rept.,
H. A. Reeder. Feb 73, 83p TRACOR-T73-AU-9520-U
Contract N00024-70-C-1274
Distribution Limitation now Removed.

Descriptors: (*Sonar equipment, *Computers), (*Data processing systems, Sonar equipment), Broadband, Passive, Sonar sound analyzers, Detection, Submarines, Antisubmarine warfare, Sequential analysis, Statistical tests, Computer programs, Algorithms, Signal-to-noise ratio.
Identifiers: Sequential likelihood ratio, *Computer aided detection.

A computer-aided detection processor has been developed for a wideband passive sonar system. The processor may be applied to a variety of passive systems. In addition to the individual processor, a general framework for a computer system that accepts and analyzes the vast quantity of data generated by a modern sonar suite has been developed. The output of this computer system is an array of alerting functions that measure the likelihood that a given coordinate vector is the location of a traget. The computer-aided detection processor for wideband passive sonar systems is based on the sequential likelihood ratio (SLR) hypothesis test. (Modified author abstract)

17B. Communication

AD-776 325/3GA PC$3.75/MF$1.45
Army Electronics Command Fort Monmouth N J
GROUND REFLECTION EFFECT ON ANTENNA GAIN FOR NAP OF THE EARTH RADIO COMMUNICATION BY NEARLY VERTICAL INCIDENCE SKYWAVE HIGH FREQUENCY PROPAGATION.
Technical rept.,
Sol Perlman. Mar 74, 54p Rept no. ECOM-4202

Descriptors: *Ground to air communications, *Antennas, High frequency, Ionospheric propagation, Gain, Reflection, Earth(Planet), Polarization, Horizontal orientation, Communication and radio systems.

The effects of ground reflection on horizontally polarized fixed station antennas are investigated for nearly vertical incidence skywave (NVIS) high frequency (HF) propagation. NVIS HF propagation can be used if beyond line-of-sight two-way radio communication without relaying to or between aircraft in low-level flight is required. Twenty-four plots were produced relating antenna height and ground reflection parameters to HF frequency and raypath elevation angle. The plots demonstrate that ground reflection reinforcement gain changes little with raypath elevation angles between 65 to 90 degrees. Calculations of raypath elevation angles for NVIS HF propagation up to flight distances of 150 miles between radio terminals indicate a minimum elevation angle of 65 degrees to distances of 60 miles by E-layer reflection and of 150 miles by 275-km high F-layer reflection. (Modified author abstract)

AD-776 340/2GA PC$5.50/MF$1.45
Dataflow Systems Inc Bethesda Md
FACSIMILE USAGE BY ENGINEERS: TEST AND EVALUATION.
Interim rept.,
J. B. Malcom. Dec 73, 47p EDS/R-61D
Contract DAAA21-73-C-0329
Report on Engineering Data Storage and Retrieval Project.

Descriptors: *Facsimile communication, *Communication equipment, *Data transmission systems, Graphics, Acceptability, Data banks, Engineering, Engineering drawings, User needs.

Under the sponsorship of the Engineering Data Storage and Retrieval (EDS and R) Project, facsimile equipment was installed and tested at the working level in several groups of users related to the engineering functions within the Army Materiel Command. The records and evaluations made during this test are summarized. Alsoo included is information gained from networks not formally part of the test. A facsimile interface unit, developed under the EDS and R Project, that stores and forwards a facsimile signal between normally incompatible units, is described, although it was not used in the test and evaluation of the user networks. The facsimile equipment used included Graphic Science, Alden and Xerox units. Brief descriptions of these units are given. (Modified author abstract)

AD-776 561/3GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
IMPROVED RADIO COMMUNICATION,
E. Danilov, and N. Shaiunov. 6 Nov 74, 3p Rept no. FSTC-HT-23-2466-72
Trans. of unidentified Russian language article, by S. Evanusa.

Descriptors: *Communication and radio systems, High frequency, Dipole antennas, Telescoping structures, Translations, USSR.

The paper describes a vertical telescopic dipole antenna for high frequency radio communications.

AD-776 671/0GA PC$5.50/MF$1.45
Stanford Research Inst Menlo Park Calif
AECO (AUTOMATIC ELECTRIC COMPANY) AUTOVON (AUTOMATIC VOICE NETWORK) SWITCH HEMP (HIGH ALTITUDE ELECTROMAGNETIC PULSE) PERFORMANCE STUDY.
Final rept. (Volume 1) Jul 72-Feb 74,
E. Neal Clark, and Jonathan A. Frost. Feb 74, 185p
Contract DCA100-72-C-0042

Descriptors: *Communication equipment, *Electromagnetic pulses, Voice communications, Vulnerability, Assessment, High altitude, Hardness, Switching, Nuclear explosion damage, Radiation effects.
Identifiers: AUTOVON(Automatic Voice Network), Automatic voice network.

The report comprises a description of the AECo AUTOVON switch, followed by a preliminary assessment of switch vulnerability to HEMP, in twenty critical circuits. The switch description covers the physical arrangement, the functional operations of the various subsystems in processing a call, the synchronization and timing of subsystem functions, and the automatic maintenance and diagnostic features of the switch. The vulnerability assessment takes into consideration the wiring, the interconnecting cable locations and lengths, and the component card circuits. The expected failure mode of each critical circuit is included. (Author)

AD-776 697/5GA Reprint
Ohio State Univ Research Foundation Columbus

THE 'PHONEMIC' CONTENT OF BACKWARD-REPRODUCED SPEECH.
Technical rept.,
John W. Black. 1 Sep 72, 13p Rept nos. TR-14, OSURF-2928-14
Contract N00014-67-A-0232-0003
Availability: Pub. in Jnl. of Speech and Hearing Research, v16 n2 p165-174 Jun 73.

Descriptors: *Speech scrambling, *Auditory perception, *Speech recognition, *Intelligibility, Phonemes, Sound pitch, Distortion, Acoustics.
Identifiers: *Speech analysis.

Three hundred pairs of consonant- (or consonantal cluster-) vowel syllables were spoken as though they were spondaic words. Students of phonetics (n,21), working individually, listened to these as backward-played speech and transcribed them in phonetic symbols. In the backward rendition there was a prevowel event, usually designated /w/. Although the vowel was uniformly /u/ and the pronunciation was verified by monitors, those listening to the backward reproduction transcribed a number of central and back vowels, usually half-closed and rarely the back, closed /u/. Some consonants when spoken initially and heard terminally as backward phonemes were identified 'corectly': /z,sf,k,r/, not /pr/. Fricativeness and nasality were preserved in backward-played speech; lateralness and glideness were not. (Author)

AD-776 783/3GA PC$15.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A COMPUTER SIMULATION OF A BASE TELECOMMUNICATION CENTER.
Master's thesis,
William E. Glaesemann, and Robert J. Robinson. Jan 74, 249p Rept no. SLSR-8-74A

Descriptors: *Communications central, Computerized simulation, Communication and radio systems, Teletype systems, Computer programs, Message processing, Theses.

The purpose of the study was to examine the use of computer simulation as an analytical aid in the management of a Base Telecommunications Center. The report discusses the communications system in general and the Base Telecommunications Center in specifics. The management areas in which a computer simulation might be helpful are discussed. The nature of the populations of the variables and the problems used to define the boundaries of the system being modeled are presented and examined. The message processing times are used as a significant measure of performance in a Telecommunication Center. The simulation output is compared to the output of the WPAFB Base Telecommunications Center and the differences are discussed. The simulation output is examined to determine its usefulness in determining the effect of different types of equipment, shift schedules, and system changes. The possibility of using a simulation to determine minimum requirements in terms of personnel and equipment was examined. (Modified author abstract)

AD-776 796/5GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
AN EXPERIMENTAL ELF RECEIVER.
Technical rept.,
Steven L. Bernstein, Dale A. McNeill, Ogden G. Nackoney, and Ira Richer. 11 Sep 73, 130p Rept no. TR-492 ESD-TR-73-242
Contract F19628-73-C-0002

Descriptors: *Radio receivers, Extremely low frequency, Submarines, Underwater communications, Signal processing, Digital systems, Adaptive systems.

The advantages of utilizing the ELF band for communications to submarines are principally the low attenuation rate of ELF signals in seawater, and the low attenuation rate in the earth-ionospheric waveguide. ELF transmitters, however, require high input power. Therefore, efficient signaling schemes and sophisticated receiver designs which help minimize the required transmitter power, and hence system costs, are particularly important. This report considers one such signaling scheme - binary convolutional encoding with antipodal modulation of a band-spread minimum-shift-keyed (MSK) carrier -- presents the design and performance of an experimental ELF receiver which includes several unique features to maximize efficiency. The receiver includes several adaptive elements such as the compensation of the ocean propagation medium, nonlinear processing of the non-Gaussian ELF noise, tracking notch filters for interference rejection, and a sequential decoder for reliable decoding at low SNR. Receiver tests included real-time reception of test messages aboard a submerged submarine in the Atlantic Ocean. (Author)

AD-776 809/6GA PC$3.25/MF$1.45
Cayuga Associates, Inc., Ithaca, N.Y.
NANOSECOND LSA MICROWAVE TRANSMITTER.
Final rept. 1 Sep 73 - 21 Nov 73,
William O. Camp, Jr. Feb 74, 41p RADC-TR-73-414
Contract F30602-72-C-0384

Descriptors: *Radio transmitters, *Microwave equipment, X band, Microwave oscillators, Gallium arsenides, Gunn effect.

The Limited Space-charge Accumulation (LSA) mode in n-type GaAs has been considered as a source of high peak power at microwave frequencies. However, because the microwave oscillation is that of a relaxation oscillator, the frequency varies rapidly with bias voltage and temperature. This presents a problem when a high degree of frequency stability is required, and must be compensated for. Furthermore, the thicker LSA devices cause a larger thermal heating and must operate at low duty cycles. However, one can trade duty cycle for device thickness and accordingly peak power. This is done in this project where a device with intermediate peak and average power (20 Watts and 200 Milliwatts) is made. The methods of frequency stabilization are investigated and the one yielding the highest degree of frequency stability is investigated. A third area investigated is that of a high PRF pulser to yield the 1% duty cycle to be used. (Author)

AD-776 812/0GA PC$4.00/MF$1.45
Bell Aerospace Co Buffalo N Y
OPTIMAL DIGITAL VOICE TRANSMISSION VOCOPLEXER.
Final rept. 29 Jun 71-22 Feb 73,
John Hrinkevich. Feb 74, 83p* RADC-TR-74-8
Contract F30602-71-C-0357

Descriptors: *Vocoders, *Pulse communications, *Processing equipment, *Voice communications, Digital systems, Pulse code modulation, Data compression, Multiplexing, Multichannel communications, Tropospheric scatter communications, Signal processing, Coders, Bandwidth, Compression.
Identifiers: AN/MRC-98.

The Vocoplexer technique for reducing the transmission rate of a digitized multi-channel communications system was investigated. Statistical processing of PCM digitized voice to remove the idle time periods was analyzed and experimental hardware was designed and fabricated. The equipment built includes separate transmit and receive processors which function to compress the digitized output rate of a TD-353/U, 48-channel PCM multiplexer for transmission and then restore it to its original rate, following reception. Circuitry is included to interface with tropospheric scatter Radio Set AN/MCR-98 at its intermediate frequency of 70 MHz. Voice channel loading is provided through the use of 48 cassette tape players and an audio monitoring unit. The recorded voice tapes used are adjusted in content to provide an individual channel activity factor of 0.25. (Modified author abstract)

AD-776 987/0GA PC$8.75/MF$1.45
General Atronics Corp Philadelphia Pa
CODEM I DATA TRANSMISSION SYSTEM. VOLUME I. THEORY.
Final rept.,
D. Chase, R. C. Harper, A. M. Joffe, R. W. Spencer, and J. S. Zaborowski, Jr. Jul 72, 111p Rept no. GAC-2125-2211-28-Vol-1
Contract N62269-70-C-0061
See also Volume 2, AD-776 988.

Descriptors: *Data transmission systems, *Information theory, Coding, Decoding, Multipath transmission, High frequency, Error correction codes, Waveforms, Fading(Electromagnetic waves), Probability, Statistical analysis, Algorithms, Digital systems, Pulse communications.
Identifiers: CODEM 1 system.

CODEM I is a data terminal set which offers the capability of obtaining extremely reliable (error rates below 0.00001) digital data transmission over an HF radio channel at a data rate equal to or greater than previous systems. The basic concept of the CODEM is the integration of error correcting coding and the modem design in such a manner that channel measurement information can be used to enhance the data reliability. CODEM I is capable of operation at 4800 bps using two independent sidebands and 2400 bps in either a dual frequency diversity mode or within a single voice bandwidth channel. In Volume 1 the CODEM concept is explained, theoretical results are obtained, and some computer and field results are presented. (Modified author abstract)

AD-776 988/8GA PC$4.75/MF$1.45
General Atronics Corp Philadelphia Pa
CODEM I DATA TRANSMISSION SYSTEM. VOLUME II. TEST RESULTS.
Final rept.,
D. Chase, R. C. Harper, A. M. Joffe, R. W. Spencer, and J. S. Zaborowski, Jr. Jul 72, 126p Rept no. GAC-2125-2211-28-Vol-2
Contract N62269-70-C-0061
See also Volume 1, AD-776 987.

Descriptors: *Data transmission systems, *Information theory, Communication equipment, Test methods, Modems, Computerized simulation, High frequency, Digital systems, Pulse communications.
Identifiers: CODEM 1 system.

CODEM I is a data terminal set which offers the capability of obtaining extremely reliable (error rates below 0.00001) digital data transmission over an HF radio channel at a data rate equal to or greater than previous systems. The basic concept of the CODEM is the integration of error correcting coding and the modem design in such a manner that channel measurement information can be used to enhance the data reliability. CODEM I is capable of operation at 4800 bps using two independent sidebands and 2400 bps in either a dual frequency diversity mode or within a single voice bandwidth channel. Volume 2 covers the complete test program carried out to determine the performance of the CODEM I equipment. This report includes the results of the field test conducted by the Naval Air Development Center. (Author)

AD-777 007/6GA PC$4.75/MF$1.45
RCA Advanced Technology Labs Camden N J
LSI DIGITAL SUBSYSTEMS FOR COMMUNICATIONS.
Final rept. 1 Jul 71-28 Sep 73,
R. Norwalt, M. Clarrocca, and R. Bergman. Mar 74, 138p* ECOM-0367-F-71
Contract DAAB07-71-C-0367

Descriptors: *Communication equipment, *Digital systems, *Integrated circuits, Logic circuits, Metal oxide semiconductors, Frequency synthesizers, Switching circuits, Radiation measuring instruments.
Identifiers: Large scale integrated circuits.

The report describes work relating to the application of LSI (large scale integration) technology. Three distinct tasks have been defined. Task A involves the combination of a silicon-on-sapphire/large scale integration (SOS/LSI) logic circuit with a voltage controlled oscillator (VCO), a phase comparator, and a crystal reference oscillator to provide a complete digital frequency synthesizer. Task B relates to the development of a monolithic CMOS LSI Digital Time Division Crosspoint Switch array. Task C consists of the development, test, and delivery of sample quantities (20) of a P-MOS LSI array that implements a portion of the digital logic of a radiation measuring instrument. These three tasks represent demonstration of several distinct applications of the MOS LSI technology. Custom design techniques were used for Task A which was implemented in the very high speed, low power CMOS/SOS technology. Standard cell design automation techniques were used in the design phase of the bulk silicon CMOS LSI array described in Task B. A third approach using the gate Universal P-MOS LSI array represents yet another facet of the MOS technology. (Modified author abstract)

COM-74-10409/2GA PC$7.75/MF$1.45
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
SPACE/TERRESTRIAL RADIO SERVICE COORDINATION AREAS: PROGRAM WARC 71.A28 USER'S MANUAL,
T. A. Harr, Jr., K. E. Bechard, and J. J. Stephenson. May 73, 92p OTM-73-139

Descriptors: *Space communication, *Computer programs, Time sharing, Compilers, Telecommunication, Programming manuals, FORTRAN.
Identifiers: FORTRAN 5 programming language, UNIVAC 1108 computers, WARC computer program.

The manual describes a computer program ('WARC 71.A28') that implements the procedure (outlined in Appendix 28 of the World Administrative Radio Conference for Space Telecommunication, Geneva 1971) for determining the co-ordination area around an Earth Station in frequency bands between 1 and 40 GHz shared by Space and Terrestrial Radio Communication Services. This program is written for use on the OEP/UNIVAC-1108 computer in UNIVAC FORTRAN 5 language, but can easily be converted for use on any computer. The manual explains how to access the computer program, how to run the computer program, how th change the input values for subsequent runs of the computer program, and how to interpret the results. (Author)

COM-74-10752/5GA PC$3.75/MF$1.45
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
CALCULATIONS OF INTERFERENCE POTENTIAL BETWEEN GEOSTATIONARY SATELLITE NETWORKS: PROGRAM WARC 71.A29 USER'S MANUAL.
Technical memo.,
T. A. Harr, Jr., and W. M. Roberts. Mar 74, 61p OTM-74-161

Descriptors: *Space communication, *Communication satellites, *Telecommunication, *Radiofrequency interference, Computer programs, Programming manuals.

The user's manual contains a program description of what the 'WARC 71:A29' does, a sample calculation, explanations, and instructions for use of the program. Guidance is provided as to the various sources of information needed to operate the program and as to the applicability and limitations of the various classes of data. Procedures applicable in the early analysis and coordination of new foreign and domestic space systems are outlined and flow diagrams are furnished as guidance to potential users of the program. (Author)

N74-16883/2GA PC$6.00/MF$1.45
Southeastern Massachusetts Univ., North Dartmouth.
LOW DATA RATE DIGITAL SPACE COMMUNICATIONS.
Final Report.
C. H. Chen. 27 Nov 73, 78p NASA-CR-132925
Contract NGR-22-031-002

Descriptors: *Digital data, *Space communication, Channels, Coding, Signal fading, Venus atmosphere.

For abstract, see STAR 1208

N74-16884/0GA PC$3.00/MF$1.45
Magnavox Research Labs., Torrance, Calif.
ADVANCED TRACKING AND DATA RELAY EXPERIMENTS STUDY: MULTIMODE TRANSPONDER EXPERIMENT ANALYSIS PROCEDURE.
Final Report, Sep. 1972 - Sep. 1973.
R. S. Cnossen, and J. Moses. 15 Sep 73, 13p NASA-CR-132913, R-4742
Contract NAS5-21824

Descriptors: *Relay, *Transponders, Airborne equipment, Coding, Radio frequency interference, Wave propagation.

For abstract, see STAR 1208

N74-16885/7GA PC$14.00/MF$1.45
Computer Sciences Corp., Falls Church, Va.
FREQUENCY MODULATION TELEVISION ANALYSIS: THRESHOLD IMPULSE ANALYSIS.
Final Report, Sep. 1972 - Nov. 1973.
W. H. Hodge. 26 Nov 73, 239p NASA-CR-132906, REPT-3007-1
Contract NAS5-21872

Descriptors: *Computer programs, *Frequency modulation, *Television transmission, Impulses, Probability density functions, Rates (Per time), Signal to noise ratios, Thresholds.

For abstract, see STAR 1208

N74-16886/5GA PC$3.75/MF$1.45
Australian Post Office Research Labs., Melbourne.
A DELTA CODED FREQUENCY MODULATED RURAL SUBSCRIBERS' RADIO SYSTEM.
R. H. Blair. Aug 73, 34p REPT-6744

Descriptors: *Frequency modulation, *Radio equipment, Binary data, Coding, Independent variables, Waveforms.

For abstract, see STAR 1208

N74-16887/3GA PC$4.50/MF$1.45
Magnavox Research Labs., Torrance, Calif.
ADVANCED TRACKING AND DATA RELAY EXPERIMENTS STUDY: MULTIMODE TRANSPONDER EXPERIMENT EQUIPMENT.
Final Report, Sep. 1972 - Sep. 1973.
R. S. Cnossen. 15 Sep 73, 29p NASA-CR-132930, R-4741
Contract NAS5-21824

Descriptors: *Ground support equipment, *Radio frequency interference, *Transponders, Aircraft equipment, Antenna arrays, Control boards, Signal processing, Transmitter receivers.

For abstract, see STAR 1208

N74-16888/1GA PC$4.50/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
TECHNOLOGY REQUIREMENTS FOR POST-1985 COMMUNICATIONS SATELLITES.
Summary Report.
J. E. Burtt, C. R. Moe, R. V. Elms, L. A. Delateur, and W. C. Sedlacek. Sep 73, 28p NASA-CR-114679
Contract NAS2-7073

Descriptors: *Communication satellites, *Technological forecasting, Bandwidth, Cost estimates, Prediction analysis techniques, Satellite antennas, Switching, Transponders, Video equipment.

For abstract, see STAR 1208

N74-16902/0GA PC$4.50/MF$1.45
Forschungsinstitut fuer Hochfrequenzphysik, Werthhoven (West Germany). Dept. of Telecommunications.
FLIGHT MEASUREMENTS IN NORTH ATLANTIC AND AFRICAN REGIONS OF MARGINAL SATELLITE VISIBILITY.
H. J. Albrecht, M. Piening, and K. Rosenbach. Oct 73, 27p REPT-3-73
Rean-Repr. From Proc. 16TH Symp. On Tactical Satellite Commun. (The Hague) 19 Sep. 1973 p 1-23.

Descriptors: *Field strength, *Ionospheric disturbances, *Scintillation, *Spacecraft communication, Africa, Atlantic ocean, Elevation angle, Equators, Flight tests, Forecasting, Periodic variations, Polar regions.

For abstract, see STAR 1208

N74-16903/8GA PC$4.00/MF$1.45
Forschungsinstitut fuer Hochfrequenzphysik, Werthhoven (West Germany).
FURTHER STUDIES ON SPEECH INTELLIGIBILITY WITH FREQUENCY-MODULATION COMMUNICATION SYSTEMS UNDER FADING CONDITIONS.
D. E. Marquart. Oct 73, 14p REPT-5-73
Rean-Repr. From 16TH Symp. On Tactical Satellite Commun. (The Hague) 19 Sep. 1973 p 45-54.

Descriptors: *Helicopters, *Signal fading, *Spacecraft communication, *Speech recognition, Articulation, Data links, Frequency modulation, Noise (Sound).

For abstract, see STAR 1208

N74-16904/6GA PC$5.75/MF$1.45
Forschungsinstitut fuer Hochfrequenzphysik, Werthhoven (West Germany). Dept. of Telecommunications.
STATISTICAL ANALYSIS OF SIGNAL FLUCTUATIONS ON A GROUND-MOBILE SATELLITE COMMUNICATION LINK.
R. Menzel. Oct 73, 52p REPT-6-73
Rean-Repr. From 16TH Symp. On Tactical Satellite Commun. (The Hague) 19 Sep. 1973 p 57-104.

Descriptors: *Ground stations, *Signal fading, *Spacecraft communication, *Statistical analysis, Data links, Power spectra, Signal reflection, Standing waves, Terrain, Wave propagation.

For abstract, see STAR 1208

N74-17567/0GA PC$19.50/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
TECHNOLOGY REQUIREMENTS FOR COMMUNICATION SATELLITES IN THE 1980'S.
Final Report.
J. E. Burtt, C. R. Moe, R. V. Elms, L. A. Delateur, and W. C. Sedlacek. Oct 73, 329p NASA-CR-114680
Contract NAS2-7073

Descriptors: *Communication satellites, *Technology assessment, Cost analysis, Satellite networks, Systems analysis.

For abstract, see STAR 1208

N74-17580/3GA PC$4.00/MF$1.45
Engins Matra, Velizy (France).
MATHEMATICAL MODELS WITH HYBRID COORDINATES USED FOR DYNAMIC SIMULATION OF GEOSTATIONARY SATELLITES WITH FLEXIBLE SOLAR PANELS MODELES MATHEMATIQUES A COORDONNEES HYBRIDES UTILISES EN SIMULATION DYNAMIQUE DES SATELLITES GEOSTATIONNAIRES EQUIPES DE PANNEAUX SOUPLES SOLAIRES.
P. Vohan, and S. A. Enginsmatra. 1973, 20p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Communication satellites, *Mathematical models, *Solar arrays, *Synchronous satellites, Coordinates, Dynamic control, Flight simulation, Satellite attitude control.

For abstract, see STAR 1208

N74-17581/1GA PC$4.75/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Automatique.
DIGITAL CONTROL OF TELECOMMUNICATIONS SATELLITE PILOTAGE NUMERIQUE DES SATELLITES DE TELECOMMUNICATIONS.
J. Lemaitre, and C. Reboulet. 1973, 31p
Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Communication satellites, *Gimbals, *Reaction wheels, *Satellite attitude control, Airborne/spaceborne computers, Analog simulation, Attitude stability, Digital simulation, Dry friction, Yaw.

For abstract, see STAR 1208

N74-17682/7GA PC$4.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
EUROPEAN PARTICIPATION IN THE DEFINITION OF THE NEXT GENERATION COMMUNICATION SATELLITE.
B. Blachier. 19 Jun 73, 13p DFH-BS-1.622/73/BB.MB
Conf-Presented at the 13TH European Space Symp., London, 25-27 Jun. 1973.

Descriptors: *Communication satellites, *European space programs, *Intelsat satellites, *International cooperation, Atlantic ocean, Pacific ocean, Satellite networks, Traffic control, Transponders.

For abstract, see STAR 1208

PB-228 180/6GA PC$4.25/MF$1.45
Federal Communications Commission, Washington, D.C. Office of the Chief Engineer.
DOUBLE SIDEBAND AND SINGLE SIDEBAND POWER AND VOLTAGE EQUIVALENCES,
Irvin Hurwitz. Nov 73, 25p* R-7305

Descriptors: *Radio transmission, *Radiofrequency power, Single sideband transmission, Double sideband transmission, Electric potential, Equivalence.

Establishes the relationships between the various powers and voltages for the different emission and modulations of interest.

PB-230 771/8GA PC$12.25/MF$1.45
Kelly Scientific Corp., Washington, D.C.
REFERENCE HANDBOOK. THE AUTOMATED FREQUENCY ASSIGNMENT SYSTEM.
Final rept.
Sep 73, 181p
Contract FCC-0042

Descriptors: *Frequency allocations, Automation, Handbooks, Communications management, Computer programming.
Identifiers: *Spectrum management, Frequency assignment.

The Reference Handbook is intended to serve as a convenient source of information in abbreviated form on various aspects of the operations of the Automated Frequency Assignment System of the Chicago Spectrum Management Center. The handbook supplements the more detailed documentary sources by providing an overview for review purposes, and by making available the more significant facts for ready reference purposes.

17C. Direction Finding

AD-776 935/9GA PC$5.50/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
PERSONNEL HOMING SYSTEM TEST REPORT ANALYSIS.
Final analysis rept.,
Morris G. Strickland. 20 Mar 74, 48p Rept no. MASSTER-TEST-1066

Descriptors: *Homing devices, *Parachutists, *Assembly, Reliability(Electronics), Test methods, Radio equipment, Human factors engineering, Electromagnetic compatibility, Direction finding.
Identifiers: *Personnel homing systems.

The test was conducted to determine, through use of the Motorola prototype, if a personnel homing system (PHS) has significant military potential and to obtain insight into the desirable features of a PHS for the purpose of assembling parachutists or other forces in overt and covert operation or for alternate usages. Because of the technical difficulties of the PHS, it should not be considered for further testing until shortcomings noted in the test report analysis are corrected. (Author)

17E. Infrared and Ultraviolet Detection

AD-776 378/2GA PC$3.25/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
ACQUISITION OF SMALL NO2 SOURCES WITH A UV CORRELATION SPECTROMETER.
Final rept.,
Hugh T. Reilly, and Gilbert Newcomb. Feb 74, 36p Rept no. LWL-CR-05C70A

Descriptors: *Gas detectors, Emitters, Field tests, Ultraviolet detectors, Remote detectors, Nitrogen oxides, Nitrogen, Dioxides, Range(Distance).
Identifiers: *Nitrogen dioxide.

The feasibility of remotely sensing NO2 emissions from a single source was explored using a UV Correlation Spectrometer manufactured by Barringer Research Ltd., Toronto, Canada. Detections were made of a 2.5 ton truck exhaust at 200 meters range and a 30 KW diesel generator at 1050 meters range to demonstrate feasibility of detecting small sources of NO2. (Author)

AD-776 379/0GA PC$3.25/MF$1.45
Battelle Columbus Labs Ohio
LOCATION OF ARTILLERY MUZZLE FLASHES AT NIGHT USING TERRESTRIAL PHOTOGRAMMETRY.
Final rept.,
J. G. Stephan, Jacob Wenig, and H. Clay McDowell. Jan 74, 34p LWL-CR-12P72
Contract F33657-71-C-0529

Descriptors: *Artillery, *Propellant flashes, *Target acquisition, *Infrared photography, Photogrammetry, Feasibility studies.

The feasibility of photogrammetically locating the position of artillery pieces by infrared photography of the muzzle flash was considered. An initial test was conducted simulating the muzzle flash with a light bulb. Two field tests were conducted with actual gun firings - one at Ft. Sill, OK, and one at Aberdeen Proving Ground, MD. A TV camera system with a response extending to the near IR is recommended as a convenient real-time sensor for artillery flash which should be usable for both day and night detections. (Author)

AD-776 497/8GA Reprint
Illinois Univ Urbana Dept of Electrical Engineering
THIN METAL FILM ROOM-TEMPERATURE IR BOLOMETERS WITH NANOSECOND RESPONSE TIME,
William H. Block, and Oscar L. Gaddy. 4 Jun 73, 11p AROD-8122.21-A
Grant DA-ARO-D-31-124-72-G99
Revision of report dated 12 Feb 73.
Availability: Pub. in IEEE Jnl. of Quantum Electronics, vQE9 n11 p1044-1053 Nov 73.

Descriptors: *Infrared detectors, *Bolometers, Thin films, Bismuth, Antimony, Chromium, Nickel, Substrates, Beryllium oxides, Photosensitivity.

The experimental and theoretical investigation of thin-film metal (bismuth, antimony, chromium, nickel) bolometers on beryllium oxide substrates is described. Responsivity, sensitivity (NEP), and time response data for each type of metal bolometer are compared with the results obtained from a thermal analysis of the bolometer. Thin-film bismuth devices can have a responsivity of 0.02.2 V/M and an NEP of 5.0 x 10 to the minus 8th power W/Hz to the 1/2 power with nanosecond response time. The authors report measurement of 2-ns response times for bismuth-film bolometers and calculated subnanosecond response times with thinner film devices. These results show that room-temperature thin-film, metal-bolometer IR detectors should be capable of detecting nanosecond and subnanosecond rise-time IR pulses with peak power levels of the order of a few milliwatts. (Author)

17G. Navigation and Guidance

AD-776 675/1GA PC$3.25/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
MAN/MACHINE RELATIONSHIP IN NATIONAL AIRSPACE SYSTEM: PLAN VIEW DISPLAY POSITIONING.
Interim rept. Jul-Sep 73,
Richard Sulzer, and Gloria Karsten. Mar 74, 35p Rept no. FAA-NA-73-90 FAA-RD-74-27

Descriptors: *Radar tracking, *Display systems, *Consoles, *Air traffic control systems, Angles, Man machine systems, Slope, Model tests, Position(Location), Elevation.
Identifiers: Radar shrimpboat tracking models, Plan view displays.

The investigation was an attempt to determine (1) the best angle that the plan view display (PVD) may be inclined while still permitting efficient operation with shrimpboats, (2) the properties of a feasible shrimpboat that will not slide so much as to produce loss of association with the target when used at the proposed angle of elevation, and (3) the properties of a feasible add-on device for fixing the PVD at the angle proposed. Several shrimpboat designs were fabricated and tested at 20, 25, and 30 degrees PVD inclinations, both in ideal con-

ditions and in a simulated control situation with air traffic controllers.

AD-776 676/9GA PC$3.25/MF$1.45
Mitre Corp Mclean Va
STUDY OF ALTERNATIVE BEACON BASED SURVEILLANCE AND DATA LINK SYSTEMS.
Final rept.,
S. R. Jones, R. C. Gibbons, A. M. Manders, N. A. Spencer, and I. B. Ylvisaker. Mar 74, 41p Rept no. MTR-6517-Vol-1 FAA-EM-74-7-1
Contract DOT-FA70WA-2448

Descriptors: *Air traffic control systems, *Radar beacons, Data links, Surveillance, Cost analysis, Digital systems.
Identifiers: ATCRBS(Air Traffic Control Radar Beacon Systems), Air traffic control radar beacon systems, DABS(Discrete Address Beacon Systems), Discrete address beacon systems.

Several beacon-based surveillance systems--both addressed and non-addressed--as well as several data link systems, in appropriate combinations, were analyzed with respect to meeting the future requirements of the Upgraded Third Generation ATC System. These requirements included surveillance characteristics suitable for automatic ground-based collision avoidance (IPC); they also included data link characteristics suitable for delivering all ATC and IPC services and estimated company digital communication services. The Discrete Address Beacon System (DABS) is shown to be the lowest cost of all alternatives for implementing IPC for the basic general aviation user. (Author)

AD-776 682/7GA PC$4.00/MF$1.45
Federal Aviation Administration Washington D C Office of Systems Engineering Management
AN OVERVIEW OF THE FAA ENGINEERING AND DEVELOPMENT PROGRAMS WITH HIGHLIGHTS OF FISCAL YEARS 1974-1975.
Mar 74, 88p Rept no. FAA-EM-74-8
See also report dated Mar 73, AD-758 284.

Descriptors: *Air traffic control systems, *Systems analysis, *Aviation safety, *Airports, Planning, Forecasting, Reports, Management, Facilities, Finance.

A report is made on the Federal Aviation Administration's developmental program for air traffic control and safety, indicating long term directions, highlighting 1974 achievements to date, and discussing the expected progress and accomplishments for 1975. It includes systems evolution, upgraded third generation control, airport characteristics, general aviation considerations, program descriptions, and management.

AD-776 699/1GA PC$12.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
EFFECTS OF AIRBORNE TRANSPONDER ANTENNA LOBE SWITCHING ON EN ROUTE (FCD) AND TERMINAL (BDAS) BEACON REPLY PROCESSING.
Final rept. on Task C,
Ernest H. Day, and James H. Pannell. 29 Jan 74, 184p Rept no. ATC-18 FAA-RD-73-109
Contract DOT-FA72WAI-242
Report on ATC Surveillance/Communication Analysis and Planning.

Descriptors: *Air traffic control systems, *Aircraft antennas, Transponders, Radar beacons, Tracking, Beacons, Switching, Antenna lobes, Military aircraft.
Identifiers: ATCRBS(Air Control Radar Beacon Systems), Air traffic control radar beacon systems, ARTS 3(Automated Radar Terminal System 3), Automated radar terminal system 3.

The comparative performances of switching top and bottom transponder antennas versus the bottom antenna alone, in target detection by ARTS III and by PCD, were investigated in order to determine which of the two antenna configurations is preferable. A variety of military aircraft participated, performing climbouts, orbits, straight and level segments, and descents, in order to expose a wide range of aspect angles to the interrogator. The frequency of occurrence of lost targets, particularly of consecutive lost targets, was found to vary considerably from one aircraft type to another. Analysis of the reduced data provides a reasonable basis, however, for concluding that, to maximize average probability of detection, the bottom antenna is better in the terminal area but switching antennas are better for En Route application. (Modified author abstract)

AD-776 714/8GA PC$3.75/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
METHODOLOGY AND COMPUTER ANALYSIS FOR DETERMINING VOR/DME AND DME/DME AREA NAVIGATION ERRORS.
Final rept. Oct 70-Sep 73,
Harry Sorensen. Feb 74, 74p Rept no. FAA-NA-73-91 FAA-RD-73-208

Descriptors: *Navigation, Errors, Computer programs, Very high frequency, Radio ranges, Distance measuring equipment, Navigational aids, FORTRAN.
Identifiers: VOR, FORTRAN 4 programming language, IBM 7090 computers.

A computer analysis of VOR/DME and DME/DME area navigation is reported. The analysis includes three-dimension error models and an automated method of selecting the optimum stations to support an area navigation route structure. It is concluded that the computer program presented is useful for determining optimum stations to support an area navigation route. Additionally, certain subroutines can be used without the full analysis program to perform line-of-sight and geodetic calculations. (Author)

AD-776 798/1GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
FALSE TARGET ELIMINATION AT ALBUQUERQUE USING ARTS-III SOFTWARE.
Technical note,
Alan G. Cameron. 12 Mar 74, 30p Rept no. TN-1974-12 ESD-TR-74-134
Contract F19628-73-C-0002

Descriptors: *Air traffic control systems, *Radar reflections, *False targets, Algorithms, Corrections, New Mexico.
Identifiers: Albuquerque International Airport, Kirtland Air Force Base, Albuquerque(New Mexico), ATCRBS(Air Traffic Control Radar Beacon Systems), Air traffic control radar beacon systems, ARTS(Automated Radar Terminal Systems), Automated radar terminal systems, ARTS 3(Automated Radar Terminal Systems 3), Automated radar terminal system 3.

Lincoln Laboratory has been assisting the U.S. Air Force Weapons Laboratory in the study of ATCRBS false targets caused by reflections from buildings at Albuquerque International Airport/Kirtland AFB. This paper discusses the false target situation there and proposes two algorithms for correcting it in ARTS-III software. The simpler of the two appears applicable to the Albuquerque situation today, and is easily extendable to correct false targets caused by new buildings. Since the process appears directly applicable to many FAA Secondary Radar installations, a more complex algorithm is also presented, which is suitable for use in very high density terminal areas. (Author)

AD-776 961/5GA PC$6.50/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
RADIOFREQUENCY INTERFERENCE/ELECTROMAGNETIC INTERFERENCE MEASUREMENTS LOS ANGELES AIR ROUTE TRAFFIC CONTROL CENTER.
Final test rept. Aug 72-Jun 73,
Margaretta V. Stone. Mar 74, 274p Rept no. FAA-NA-73-92 FAA-RD-74-11
Contract DOT-FA72NA-728

Descriptors: *Air traffic control systems, *Electromagnetic interference, Radiofrequency interference, Automation, Measurement, California.

The report describes electromagnetic interference tests at the Los Angeles Air Route Traffic Control Center (ARTCC), Palmdale, California. Measurements included radiated and conducted emission from the automated system and nonautomated equipments, and radiated and conducted susceptibility of the automated system. (Modified author abstract)

AD-777 041/5GA PC$3.00/MF$1.45
Naval Electronics Lab Center San Diego Calif
DIFFERENTIAL OMEGA NAVIGATION FOR THE U.S. COASTAL CONFLUENCE REGION. PART I: OVERVIEW.
Research and development rept. Apr-Nov 73,
E. R. Swanson, D. J. Adrian, and P. H. Levine. 2 Jan 74, 16p Rept no. NELC-TR-1905-Part-1
See also AD-777 043.

Descriptors: *Radio navigation, Very low frequency, Hyperbolic navigation, Corrections, Coastal regions, Oceans, United States, Radio transmission, Telemeter systems.
Identifiers: *Differential omega navigation system, Omega navigation system, Coastal confluence navigation.

Differential Omega is a navigation system based upon the real-time dissemination of Omega corrections for an area around a monitor site at a known location. This investigation of its potential for meeting Navy navigational requirements in the U.S. coastal confluence region (CCR), where traffic patterns tend to converge, finds that a system of 29 base stations -- only one of them new -- would provide CCR coverage with cross-track accuracy of about 1/4 nmi. Station spacing proposed for the Gulf of Mexico provides accuracy of 1/4 nmi or better throughout the fairway area. The publication of a series of volumes on differential Omega is projected. (Author)

AD-777 043/1GA PC$4.75/MF$1.45
Naval Electronics Lab Center San Diego Calif
DIFFERENTIAL OMEGA NAVIGATION FOR THE U.S. COASTAL CONFLUENCE REGION. PART II: REQUIREMENTS, ACCURACIES, AND SYSTEM DEFINITION.
Research and development rept. Apr-Nov 73,
E. R. Swanson, D. J. Adrian, and P. H. Levine. 2 Jan 74, 135p Rept no. NELC-TR-1905-Part-2
See also AD-777 041

Descriptors: *Radio navigation, Very low frequency, Hyperbolic navigation, Telemeter systems, Corrections, Coastal regions, Oceans, United States, Accuracy, Systems analysis.
Identifiers: *Differential omega navigation system, Omega navigation system, Coastal confluence navigation.

Differential Omega is a navigation system based upon the real-time dissemination of Omega corrections for an area around a monitor site at a known location. This investigation of its potential for meeting Navy navigational requirements in the U.S. coastal confluence region (CCR), where traffic patterns tend to converge, finds that a system of 29 base stations--only one of them new--would provide CCR coverage with cross-track accuracy of about 1/4 nmi. Station spacing proposed for the Gulf of Mexico provides accuracy of 1/4 nmi or better throughout the fairway area. (Author)

COM-74-10689/9GA PC$5.50/MF$1.45
All Systems, Moorestown, N.J.

MARITIME SATELLITE NAVIGATION/COMMUNICATION PROGRAM. VOLUME I. EXECUTIVE SUMMARY.
Final rept. Jun 71-Oct 73, on Phase 2.
15 Nov 73, 49p AII-MAR594-R-023-1 MA-RD-900-74030
Contract MA-1-35594
See also Volume 2, COM-74-10690.

Descriptors: *Radio navigation, *Radio relay systems, Communication satellites, Navigation satellites, Synchronous satellites, Merchant ships, Transponders, C band, Radio equipment.
Identifiers: *Maritime communication systems, Maritime navigation systems, ATS-5 satellite, ATS-3 satellite, Maritime satellite communication and navigation, MARSCAN(Maritime Satellite Communication and Navigation).

Volume I provides in summary form, a description of the design and operational features of the experimental Maritime Satellite Communication and Navigation (MARSCAN) System. The MARSCAN system consists of (1) a Maritime Coordination Center (MCC) located at the National Maritime Research Center (NMRC), Kings Point, New York, (2) Earth stations for communicating with the two satellites used in the system, (3) the NASA ATS-5 and ATS-3 synchronous equatorial satellites providing C-band transponders for relaying RF signals, (4) the ship terminals located on U.S. merchant ships plying the Atlantic and Pacific Oceans and (5) user terminals linked with the MCC through data phone land lines. This system provided the means for conducting communication and navigation experiments in an operational environment. This volume also summarizes the results of engineering and user-oriented experiments performed during the program.

COM-74-10690/7GA PC$15.50/MF$1.45
AII Systems, Moorestown, N.J.
MARITIME SATELLITE NAVIGATION/COMMUNICATION PROGRAM. VOLUME II. EXPERIMENTAL SYSTEM DESCRIPTION.
Final rept., Jun 71-Oct 73, on Phase 2.
15 Nov 73, 247p AII-MAR594-R-023-2 MA-RD-900-74022
Contract MA-1-35594
See also Volume 1, COM-74-10689 and Volume 3, COM-74-10691.

Descriptors: *Radio navigation, *Radio relay systems, Communication satellites, Navigation satellites, Synchronous satellites, Merchant ships, Transponders, C band, Radio equipment, Experimental design.
Identifiers: *Maritime communication systems, Maritime navigation systems, ATS-5 satellite, ATS-3 satellite, Maritime satellite communication and navigation, MARSCAN(Maritime Satellite Communication and Navigation).

Volume II provides a description of the design and operational features of the experimental Maritime Satellite Communication and Navigation (MARSCAN) system. The system consists of (1) a Maritime Coordination Center (MCC) located at the National Maritime Research Center (NMRC), Kings Point, New York, (2) Earth stations for communicating with the two satellites used in the system, (3) the NASA ATS-5 and ATS-3 synchronous equatorial satellites providing C-band transponders for relaying RF signals, (4) the ship terminals located on U.S. merchant ships plying the Atlantic and Pacific Oceans and (5) user terminals linked with the MCC through data phone land lines. This system provided the means for conducting communication and navigation experiments in an operational environment.

COM-74-10691/5GA PC$12.75/MF$1.45
AII Systems, Moorestown, N.J.
MARITIME SATELLITE NAVIGATION/COMMUNICATION PROGRAM. VOLUME III. EXPERIMENT RESULTS.
Final rept., June 71-Oct 73, on Phase II.
15 Nov 73, 194p AII-MAR594-R-023-3 MA-RD-900-74032
Contract MA-1-35594
See also Volume 1, COM-74-10689.

Descriptors: *Radio navigation, *Radio relay systems, Communication satellites, Navigation satellites, Synchronous satellites, Merchant ships, Transponders, C band, Radio equipment, Experimental design, Experimental data.
Identifiers: *Maritime communication systems, Maritime navigation systems, ATS-5 satellite, ATS-3 satellite, Maritime satellite communication and navigation, MARSCAN(Maritime Satellite Communication and Navigation).

Volume III provides a description of the experimental results achieved during testing of the experimental Maritime Satellite Communication and Navigation (MARSCAN) system. The experiment period extended from March 1973 to August 1973, during which both engineering and user-oriented tests were performed. The MARSCAN system consists of (1) a Maritime Coordination Center (MCC) located at the National Maritime Research Center (NMRC), Kings Point, New York, (2) Earth stations for communicating with the two satellites used in the system, (3) the NASA ATS-5 and ATS-3 synchronous equatorial satellites providing C-band transponders for relaying RF signals; (4) the ship terminals located on U.S. merchant ships plying the Atlantic and Pacific Oceans and (5) user terminals linked with the MCC through data phone land lines. This system provided the means for conducting communication and navigation experiments in an operational environment.

N74-17385/7GA PC$3.75/MF$1.45
Drexel Univ., Philadelphia, Pa.
DEVELOPMENT OF VISUAL-DISPLAY AID TO AIR NAVIGATION.
Final Report, 1 Jan. 1972 - 31 Mar. 1973.
T. J. Matcovich. Apr 73, 62p NASA-CR-132412
Contract NGR-39-004-038

Descriptors: *Air navigation, *Display devices, *Liquid crystals, *Navigation aids, Electronic equipment, Vhf omnirange navigation.

For abstract, see STAR 1208

PAT-APPL-451 448 PC$4.00/MF$1.45
Department of Transportation, Washington, D.C. WEDCOM.
Patent Application,
Robert W. Wedan. Filed 15 Mar 74, 10p
DOT/Case-TSC-10042
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Air traffic control, *Pulse communication, *Patent applications, Display devices.
Identifiers: PAT-CL-235-150.

The patent application describes a digital communication system between pilots and traffic controller wherein air traffic control (ATC) instructions are displayed for the pilots with provision for communicating pilot response to ground control.

17H. Optical Detection

AD-776 814/6GA PC$4.00/MF$1.45
Hughes Research Labs Malibu Calif
COHERENT OPTICAL ADAPTIVE TECHNIQUES (COAT).
Technical rept. no. 2, 26 Jun-26 Sep 73,
S. Hansen, L. S. Horwitz, R. M. Kubo, S. P. Lazzara, and T. R. O'Meara. Oct 73, 91p RADC-TR-74-38
Contract F30602-73-C-0248, ARPA Order-1279
See also AD-772 639.

Descriptors: *Optical radar, *Phased arrays, Lasers, Self organizing systems, Control systems, Computerized simulation, Electronic equipment, Transmitters, Receivers, Systems engineering.
Identifiers: COAT(Coherent Optical Adaptive Techniques), Coherent optical adaptive techniques.

The report covers the fabrication phase of an experimental program to design, fabricate and evaluate an eighteen-element, self-adaptive, laser phased array. Computer simulation efforts were extended to aid in designing system electronics and in analyzing servo-loop performance for rapid glint selection and adaptive array focusing. The hardware configurations for the beamsplitter-mirror assembly (Phasor matrix), electronics and receiver/transmitter channels are described in this report along with the construction progress of the multiglint target hardware and propagation range instrumentation. A revised calibration and measurements program is described which reflects a 3-month delay in the completion of system electronics. (Author)

N74-17165/3GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LARGE SPACE TELESCOPE (LST) POINTING CONTROL SYSTEM (PCS) ANALYTICAL ADVANCED TECHNICAL DEVELOPMENT (ATD) PROGRAM.
S. M. Seltzer. 14 Feb 74, 20p NASA-TM-X-64806

Descriptors: *Large space telescope, *Pointing control systems, Algorithms, Computerized simulation, Nonlinear systems.

For abstract, see STAR 1208

N74-17167/9GA PC$8.00/MF$1.45
Texas Instruments, Inc., Dallas. Central Research Labs.
CHARGE-COUPLED DEVICE IMAGE SENSOR STUDY.
Final Technical Report.
3 Dec 73, 100p NASA-CR-136936
Contracts NAS7-100, JPL-953673
Subm-Prepared for JPL.

Descriptors: *Electrical properties, *Imaging techniques, *Optical equipment, *Solid state devices, Equipment specifications, Product development, Remote sensors, Test equipment.

For abstract, see STAR 1208

N74-17168/7GA PC$7.25/MF$1.45
Fairchild Camera and Instrument Corp., Mountain View, Calif. Semiconductor Components Group.
CHARGE COUPLED DEVICE IMAGE SENSOR STUDY.
Final Report.
Feb 74, 85p NASA-CR-136937
Contracts NAS7-100, JPL-953674
Subm-Prepared for JPL.

Descriptors: *Imaging techniques, *Optical equipment, *Remote sensors, *Spacecraft instruments, Equipment specifications, Performance tests, Reliability analysis, Research projects.

For abstract, see STAR 1208

N74-17212/3GA PC$4.00/MF$1.45
Radio Corp. of America, Burlington, Mass. Aerospace Systems Div.
LASER RANGE POLE FIELD EVALUATION REPORT.
Dec 73, 14p NASA-CR-132927
Contract NAS5-23092
Subm-Sponsored in Part by US Forest Service.

Descriptors: *Laser range finders, *Performance tests, *Reliability engineering, Environment effects, Equipment specifications, Human factors engineering.

For abstract, see STAR 1208

N74-17220/6GA PC$4.25/MF$1.45
Impulsphysik G.m.b.H., Hamburg (West Germany).
LIDAR TECHNIQUE AND VISUAL RANGE MEASUREMENT. REVIEW OF STATE-OF-THE-ART LIDAR TECHNIK UND SICHTWEITENMESSUNG. UEBERSICHT UEBER DEN DERZEITIGEN STAND DER TECHNIK.
F. Fruengel. 1972, 25p
Language in German.

Descriptors: *Atmospheric optics, *Optical radar, *Range finders, Cloud height indicators, Image contrast, Light scattering, Light transmission, Visibility.

For abstract, see STAR 1208

RD/B/N-2775 PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
ASSESSMENT OF THE PERFORMANCE OF AN EXTENDED SPECFIELD SERIES D2 ENDOSCOPE AND A COMPARISON WITH ALTERNATIVE VIEWING SYSTEMS.
A. Jones. Aug 73, 10p
U.S. Sales Only.

Descriptors: (*Remote viewing equipment, *Performance testing), Comparative evaluations, Fibers, Optical systems, Television.

For abstract, see NSA 29 07, number 16425.

17I. Radar Detection

AD-776 912/8GA PC$9.50/MF$1.45
Army Electronics Command Fort Monmouth N J
ADJUSTABLE DIGITAL TIME CONVERTER.
Technical rept.,
Helmuth M. Kaunzinger, and Otto E. Rittenbach.
Feb 74, 130p Rept no. ECOM-4201

Descriptors: *Signal processing, *Moving target indicators, Radar signals, Processing equipment, Compression, Time, Digital systems, Analog to digital converters, Frequency conversion, Target recognition, Target signatures, Computerized simulation, Computer programs, FORTRAN.
Identifiers: COMP computer program, FORTRAN 4 programming language.

The presentation covers the analysis, computer solution and simulation, design, construction and performance evaluation of an experimental digital time converter with five compression ratios ranging from 3.16 to 316 in a geometric progression. With an analog to digital converter at the input and a digital to analog converter at the output, this time converter operates with data samples circulating in register rings. The updating of this rotating information occurs at selected slow rates while readout samples are taken at a constant fast rate. The original sequence of input samples is preserved in the compressed output when a correct relationship exists between updating and readout rates, generated in appropriate timing circuits. The compressed signal is presented in segments of approximately .5 second each. The performance evaluation shows that the chosen approach is valid, that an experimental model works as expected, and that subsequent radar systems studies can be made with this time converter. (Modified author abstract)

COM-74-50232/9GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
FM/CW RADAR SIGNALS AND DIGITAL PROCESSING.
Technical rept.,
Donald E. Barrick. Jul 73, 28p NOAA-TR-ERL-283, WPL-26 NOAA-74013113
Sponsored in part by Defense Advanced Research Projects Agency, Washington, D.C.
Paper copy available from GPO $0.60 as C55.13:ERL 283-WPL26.

Descriptors: *Radar signals, *Acoustic signals, *Signal processing, Digital systems, Radar detection, Acoustic detection, Fourier transformation.
Identifiers: Fast fourier transform.

The use and processing of the FM/CW signal for radar and acoustic sounder systems are examined. An example involving an HF backscatter radar is used to permit the reader to see how the techniques are applied to an actual problem. A linearly swept-frequency signal format is used in a 100% duty factor mode. In the receiver, a replica of the linear FM signal is mixed with the received waveform at an offset such that the desired range window is observed with the lowest possible IF frequency variation. This pulse train is then analog-to-digital (A/D) converted and ready for computer processing. Two techniques are described and analyzed for digitally processing the signal via the Fast-Fourier-Transform (FFT) algorithm. It is shown that both techniques are identical, in that they produce the same information and require the same number of computer steps in executing the required FFTs. Finally, simple 'cookbook' rules are given for obtaining the signal and processing parameters based on the radar and target range/velocity specifications. (Modified author abstract)

17J. Seismic Detection

AD-776 428/5GA Reprint
Mackay School of Mines Reno Nev Seismological Lab
LOCAL SEISMIC PHENOMENA IN THE FIRST THREE SECONDS AFTER UNDERGROUND NUCLEAR EXPLOSIONS.
Gary Boucher. 30 Oct 72, 15p AFOSR-TR-74-0292
Grant AF-AFOSR-2041-71, ARPA Order-1584
Revision of report 6 Mar 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n8 p1348-1360, 10 Mar 73.

Descriptors: *Seismic detection, *Seismic data, *Nuclear explosions, *Underground explosions, Seismological stations, Earthquakes, Identification, Blast, Seismic arrays, Seismic waves, Seismology, Nevada.
Identifiers: Benham shot, Greeley shot, Knickerbocker shot, Faultless shot.

Accelerograms obtained at distances under 100 km from four underground nuclear explosions in Nevada were studied to determine the possibility of identifying secondary seismic events immediately following the explosion. There is a strong suggestion that two events were identifiable in the case of the underground test Benham. For the Faultless test, an earthquake-type event occurred about 1.5 seconds after the blast, and about 1 km from the shotpoint. (Author)

AD-776 815/3GA PC$4.00/MF$1.45
Texas Instruments Inc Dallas Equipment Group
EXTENDED ARRAY EVALUATION PROGRAM. SPECIAL REPORT NO. 5. SELECTION OF REFERENCE WAVEFORMS FOR MATCHED FILTER PROCESSING OF LONG PERIOD SIGNALS FROM SEISMIC EVENTS,
Rudolf Unger. 24 Oct 73, 86p
Contract F33657-72-C-0725, ARPA Order-1714
See also report dated 29 Jun 73, AD-771 111.

Descriptors: *Seismological stations, *Underground explosions, *Seismic detection, Seismic arrays, Data processing, Signal to noise ratio, Earthquakes, Nuclear explosions, Matched filters, Signal processing, Surface waves, USSR.
Identifiers: Alaskan long period array, Vela Uniform.

In an attempt to find optimum reference waveforms for matched filtering long period signals, several reference waveforms varying in duration and signal contents were taken from Alaskan Long Period Array recordings of major events in the Sinkiang Province area. Each of these reference waveforms was used as a matched filter in processing a number of other events in the same area. The events differ in magnitude, location and depth. Analysis of the signal-to-noise ratio gains (relative to bandpass filtering) showed that optimum processing of all events required a large number of reference waveforms. This processing yielded up to 8 dB improvement over to-date routine matched filter processing of Central Asia events. Several other aspects of reference waveform matched filtering also are discussed. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

BNWL-SA-4777 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa); Wisconsin Univ., Madison (Usa). Dept. Of Nuclear Engineering.
PRELIMINARY ASSESSMENT OF CORROSION PRODUCT TRANSPORT IN FUSION REACTORS.
A. B. Jr. Johnson, and W. F. Vogelsang. 5 Nov 73, 11p CONF-731101-48

Descriptors: (*Thermonuclear reactors, *Corrosion products), Corrosion, Lithium, Motion, Stainless steels.

For abstract, see NSA 29 07, number 17424.

BNWL-SA-4792 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
PROJECTION OF GRAPHITE BEHAVIOR: COMPARISON OF RESULTS ON FOUR CONCEPTUAL FUSION REACTOR DESIGNS.
W. J. Gray, and W. C. Morgan. Aug 73, 20p
CONF-731114-46
Contract AT(45-1)-1830

Descriptors: (*Thermonuclear reactors, *Physical radiation effects), (*Graphite, Physical radiation effects), Comparative evaluations, Fission, Neutron reactions, Tokamak devices, Toroidal theta pinch devices.

For abstract, see NSA 29 07, number 17425.

CONF-731114-45 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
ASPECTS OF THETA PINCH POWER PLANT DEVELOPMENT.
T. A. Coultas, and R. A. Krakowski. 1973, 13p

Descriptors: (*Toroidal theta pinch devices, *Design), Efficiency, Energy storage, Power plants, Thermonuclear reactors.

For abstract, see NSA 29 07, number 17426.

IAE-2253 PC$3.25/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
METHODS OF OBTAINING LIMITING ELECTRICAL OUTPUTS IN SHORT PULSES.
M. V. Babykin, and A. V. Bartov. 1972, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Thermonuclear devices, Power supplies), (*Power supplies, *Electric currents), Pulses, Specifications.

For abstract, see NSA 29 07, number 17427.

LA-5474-P PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).

PROPOSAL FOR THE CONSTRUCTION OF A SCYLLA IV-P CONFINEMENT STUDIES THETA PINCH.
W. R. Jr. Ellis, W. B. Riesenfeld, and G. A. Sawyer. Dec 73, 22p
Contract W-7405-eng-36

Descriptors: (*Scylla devices, *Specifications), Instability growth rates, Linear theta pinch devices, Plasma macroinstabilities, Scaling laws.

For abstract, see NSA 29 07, number 17428.

MATT-1008 PC$6.50/MF$1.45
Princeton Univ., N.J. (Usa). Plasma Physics Lab.
SWAN: A CODE FOR THE ANALYSIS AND OPTIMIZATION OF FUSION REACTOR NUCLEONIC CHARACTERISTICS.
E. Greenspan, W. G. Jr. Price, and H. Fishman. Nov 73, 87p
Contract AT(11-1)-3073

Descriptors: (*Computer codes, *S codes), (*Neutron transport theory, S codes), (*Thermonuclear reactors, Neutron transport theory), Breeding blankets, One-dimensional calculations, Variational methods.

For abstract, see NSA 29 07, number 17429.

MATT-1010 PC$3.00/MF$1.45
Princeton Univ., N.J. (Usa). Plasma Physics Lab.
THERMAL STRESS UNDER HIGH-POWER SURFACE HEATING.
J. F. Schivell, and D. J. Grove. Nov 73, 13p
Contract AT(11-1)-3073

Descriptors: (*Reactor materials, *Thermal stresses), (*Hot plasma, Thermal stresses), (*Thermonuclear reactors, Thermal stresses), Absorption, Plasma, Plates, Surfaces.

For abstract, see NSA 29 07, number 17430.

MATT-1012 PC$3.00/MF$1.45
Princeton Univ., N.J. (Usa). Plasma Physics Lab.
IMPURITY CONCENTRATION IN THE ATC.
F. De Marco. Nov 73, 10p
Contract AT(11-1)-3073

Descriptors: (*Atc devices, *Impurities), Adiabatic compression heating, Confinement, Distribution, Electric conductivity, Ions, Spectra.

For abstract, see NSA 29 07, number 17431.

AD-164 491/3GA PC$4.00/MF$1.45
Department of the Air Force Washington D C
SHOCK HEATED, WALL CONFINED FUSION POWER SYSTEM.
Patent application,
R. A. Gross. Filed 28 Aug 73, 7p Rept no. PAT-APPL-392 377
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Nuclear fusion, *Electric power. Patents, Magnetohydrodynamics, Deuterium, Tritium.
Identifiers: PAT-CL-176-7, *Patent applications.

The invention relates generally to a system for obtaining useful power from controlled thermonuclear fusion and more specifically to a system which produces electrical power from the consumption of deuterium and tritium gas.

18B. Isotopes

CNEA-351 PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
OBTAINING PERTECHNETATE SOLUTIONS (TC-99M) WITH HIGH ACTIVITY CONCENTRATION.
A. Karpeles, and M. Rivero. 1973, 19p
In Spanish. U.S. Sales Only.

Descriptors: (*Technetium 99, *Isotope production), (*Technetium, *Solvent extraction), Carrier-free isotopes, Ion exchange, Isomeric nuclei, Ketones, Molybdenum oxides, Pertechnetates, Sodium hydroxides.

For abstract, see NSA 29 07, number 15426.

DP-1320 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
CALIFORNIUM OXIDE--PALLADIUM CERMET WIRE AS A EXP 252 CF NEUTRON SOURCE FORM.
W. C. Mosley, P. E. McBeath, and P. K. Smith. Jan 74, 42p
Contract AT(07-2)-1

Descriptors: (*Californium 252, Neutron sources), (*Neutron sources, *Fabrication), Californium oxides, Cermets, Palladium, Wires.

For abstract, see NSA 29 07, number 15806.

K-L-6332 PC$3.00/MF$1.45
Oak Ridge Gaseous Diffusion Plant, Tenn. (Usa).
RAREFIED FLOW AND DIFFUSION OF NEON ISOTOPES.
D. E. Fain, and W. K. Brown. 9 Nov 73, 13p
CONF-731129-1

Descriptors: (*Neon isotopes, Gaseous diffusion process), (*Gaseous diffusion process, *Efficiency), Geometry, Pressure dependence.

For abstract, see NSA 29 07, number 15798.

K-1854 PC$5.45/MF$1.45
Oak Ridge Gaseous Diffusion Plant, Tenn. (Usa).
KEYWORD INDEX TO UNCLASSIFIED ORGDP FORMAL REPORTS, JULY 1947--SEPTEMBER 1973.
J. B. Ferguson, and R. J. Fraser. Jan 74, 90p
Contract W-7405-eng-26

Descriptors: (*Gaseous diffusion process, *Bibliographies), (*Uranium 235, Gaseous diffusion process), Indexes, Information retrieval.

For abstract, see NSA 29 07, number 15797.

18C. Nuclear Explosions

AD-776 361/8GA PC$4.75/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
EXPLOSIVE SELECTION AND FALLOUT SIMULATION EXPERIMENTS NUCLEAR CRATERING DEVICE SIMULATION (PROJECT DIAMOND ORE).
Final rept.,
J. M. O'Connor, T. J. Donlan, and D. E. Burton. Oct 73, 145p Rept no. AEWES-TR-E-73-6

Descriptors: *Underground explosions, *Nuclear explosions, *Explosion effects, *Computerized simulation, *Cratering, Fallout, Blast, Ground motion, Ejecta.
Identifiers: Project Diamond Ore.

Project Diamond Ore was initiated in FY 1971 to determine the effects of different types of stemming, depths of burial, and geologic conditions on the crater size and collateral effects produced by the subsurface detonation of a nuclear cratering device. This determination is being made by using a combination of hydrodynamic code calculations and large-scale chemical explosive charges to model the nuclear explosive energy source. The research program also includes development of a nuclear fallout simulant. This report presents a detailed summary of the explosive selection and testing process and the development and testing of the fallout simulants. (Modified author abstract)

CONF-731101-47 PC$3.25/MF$1.45
Blume (John a.) and Associates, Engineers, San Francisco, Calif. (Usa).
MODIFICATION OF THE COLONY TOWER FOR THE RIO BLANCO DETONATION .
J. A. Blume, L. A. Lee, S. A. Freeman, and K. K. Honda. 21p

Descriptors: (*Mechanical structures, *Seismic effects), (*Rio blanco event, *Ground motion).

For abstract, see NSA 29 07, number 15533.

N74-17616/9GA PC$8.25/MF$1.45
Ernst-Mach-Inst., Freiburg (West Germany).
LOAD TRANSMITTED TO FRAME BUILDINGS DURING BLOWOUT OF SURFACE PANELS BY NUCLEAR BLAST.
G. Sliter. Oct 72, 105p REPT-1/73
Subm-Sponsored by Bundesmin. Fuer Wohnungswesen und Staedtebau.

Descriptors: *Blast loads, *Buildings, *Dynamic structural analysis, *Nuclear explosion effect, *Panels, *Shock tests, Asbestos, Beams (Supports), Blowouts, Cements, Elastic deformation, Fracture strength, Shadowgraph photography, Shock tubes, Steel structures.

For abstract, see STAR 1208

PB-231 010/0GA PC$4.50/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT IMPLICATIONS TO STATE GOVERNMENTS.
Final rept.,
Glenn A. Whan. Sep 73, 119p* NSF-RA-G-73-012
Grant NSF-GT-21
See also PB-231 011.

Descriptors: *Nuclear explosions, *Technology assessment, *State government, Environmental surveys, Benefit cost analysis, Seismic waves, Radioactivity, Employment, Taxes, Damage, Claims, Health.
Identifiers: *Plowshare operation.

The report summarizes the findings, conclusions, and recommendations of a study conducted by an interdisciplinary research team for the Western Interstate Nuclear Board (WINB) to provide information and guidelines to be used by the states of the Western Interstate Nuclear Compact in planning and decision making related to commercial Plowshare projects. The study centers on the safety and welfare implications associated with the use of underground, deeply buried, nuclear explosives in commercial applications. (Author)

PB-231 011/8GA PC$4.50/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT, PROSPECTIVES FOR NUCLEAR-STIMULATED GEOTHERMAL POWER IN THE WESTERN U.S.,
Gary M. Sandquist. Feb 73, 115p* NSF-RA-G-73-014
Grant NSF-GT-21
See also PB-231 012.

Descriptors: *Nuclear explosions, *Geothermal prospecting, Stimulation, Environmental surveys, Government, Liabilities, Insurance, Radiation hazards, Risk.
Identifiers: *Plowshare operation, *Geothermal energy, *Nuclear stimulation.

The feasibility of using nuclear explosives to stimulate the output of geothermal sites is examined for the Western U.S. Actual explosives applications appear limited to marginal geothermal sites where explosive yield of 100 KT or less is adequate.

PB-231 012/6GA PC$3.25/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT. SEISMIC EFFECTS,
Robert D. Busch, and Glenn A. Whan. Jul 73, 46p* NSF-RA-G-73-017
Grant NSF-GT-21
See also PB-231 011.

Descriptors: *Nuclear explosions, *Environmental surveys, *Seismic waves, Earthquakes, Underground explosions, Geological surveys, Buildings, Damage assessment, Oil shale.
Identifiers: *Plowshare operation, Ground motion.

The report presents the results of a study conducted to summarize and evaluate current theoretical and experimental analyses of the environmental effects of ground motion from underground nuclear explosions. Effects on geological formations, buildings, and surface structures, as well as ecological impacts are discussed. (Author)

PB-231 014/2GA PC$4.75/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT LEGAL STUDIES. VOLUME I. STATE POWER OVER PLOWSHARE: CONSTITUTIONAL FRAMEWORK, AND PRE-EMPTIVE CAPABILITY OF FEDERAL POWER,
David E. Engdahl. Mar 73, 139p* NSF-RA-G-73-019
Contract NSF-GT-21
Paper copy also available from NTIS $12.00/set of 3 reports as PB-231 013-SET.

Descriptors: *Nuclear explosions, *State government, *National government, Regulations, Venn diagrams, Legislation, Law(Jurisprudence).
Identifiers: *Plowshare operation.

'State Power Over Plowshare' is an analytical overview of the constitutional principles that support the power of states to control peaceful nuclear explosive activities in the United States notwithstanding the operational involvement of the United States Atomic Energy Commission in such activities. 'Pre-Emptive Capability of Federal Power' is a more extended and more fully documented examination of the capability and incapability of various federal regulations and activities to pre-empt regulatory controls and policy determinations of the states. It explains the need for ascertaining the pre-emptive capability of a particular federal regulation or activity before the effect of pre-emptive federal intent can be assessed.

PB-231 015/9GA PC$6.00/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT LEGAL STUDIES. VOLUME II. STATE AND FEDERAL POWER OVER FEDERAL PROPERTY,
David E. Engdahl. Mar 73, 233p NSF-RA-G-73-019A
Contract NSF-GT-21
Paper copy also available from NTIS $12.00/set of 3 reports as PB-231 013-SET.

Descriptors: *Nuclear explosions, *State government, *National government, Regulations, Legislation, History, Law(Jurisprudence).
Identifiers: *Plowshare operation.

The report gives a detailed historical and analytical examination of the evolution and present status of constitutional principles governing the power of states and of the United States over federally-owned property, tracing the sources of the intellectual confusion that has made this a complicated and widely misunderstood branch of constitutional law. The origin and development of doctrine under both Article I, section 8, clause 17, and Article IV, section 3, clause 2 are examined, in the light of contemporaneously evolving principles on other aspects of constitutional law, in order to expose the premises and points of probable future modification of modern property clause doctrine. The currently prevailing notions as well as the likely future developments with respect to state and federal power over federal property are analyzed and discussed.

PB-231 016/7GA PC$3.75/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT LEGAL STUDIES. VOLUME III. DEFICIENCIES OF PRICE-ANDERSON PROTECTION FOR PLOWSHARE, AND OTHER LEGAL PAPERS,
David E. Engdahl, Owen Olpin, and Edwin B. Firmage. Mar 73, 69p NSF-RA-G-73-019B
Contract NSG-GT-21
Paper copy also available from NTIS $12.00/set of 3 reports as PB-231 013-SET.

Descriptors: *Nuclear explosions, *State government, *National government, Regulations, Legislation, Law(Jurisprudence), International law.
Identifiers: *Plowshare operation, Price-Anderson Indemnity Act, Atomic Energy Act.

The report contains four papers discussing the applicability of the Price-Anderson amendment of the Atomic Energy Act to damages from peaceful applications of nuclear explosives; a possible different system for citizen redress for damages caused by such applications of nuclear explosives; and the international law ramifications of utilization of peaceful nuclear explosives technology in the United States.

PB-231 017/5GA PC$9.25/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT. PUBLIC PARTICIPATION (WITH REFERENCE TO NUCLEAR STIMULATION OF NATURAL GAS).
Fikry S. Gahin. Jan 73, 124p NSF-RA-G-73-020
Grant NSF-GT-21

Descriptors: *Nuclear explosions, *Natural gas, *Gas production, Stimulation, Environmental surveys, Seismic waves, Earthquakes, Radiation hazards, Local government, Liabilities, Insurance, Risk.
Identifiers: *Plowshare operation, *Nuclear stimulation.

The report presents several aspects of Nuclear Stimulation of Natural Gas including risk analysis of ground motions and radiation risk, impact of local communities, legal and statutory problems, insurance and government indemnity, dissemination of public information and public participation methods in the decision-making process. The report also includes a published article on 'Legal Liability and Insurance in Nuclear Stimulation of Natural Gas.'

PB-231 037/3GA PC$4.00/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT. NOMINAL SEISMIC EFFECTS,
John C. Bellamy, and Roy E. Brewer. Aug 72, 18p NSF-RA-G-73-016
Contract NSF-GT-21
See also PB-231 040.

Descriptors: *Nuclear explosions, *Seismology, Underground explosions, Building codes, Earthquakes.
Identifiers: *Plowshare operation.

Perspective concerning the possible seismic effects of deep underground nuclear explosions is provided by relating them to the energies, intensities and magnitudes of natural earthquakes and to the provisions of the Uniform Building Code. Toward this end the typically representative relationship between seismic intensities and explosive energies listed in Table 1 is derived. It clearly shows that the seismic energy of such explosions is several orders of magnitude less than that of destructive earthquakes, and that only minor structural damage is to be expected from deep potentially-useful explosions with yields up to about that of 100 thousand tons of TNT. (Author)

PB-231 038/1GA PC$4.75/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT. MATERIAL RESOURCES ANALYSIS,
Paul A. Bell, and Glenn A. Whan. Jan 73, 34p
Contract NSF-GT-21
See also PB-231 039.

Descriptors: *Nuclear explosions, *Natural gas, *Nuclear fuels, Stimulation, Availability, Gas production, Costs.
Identifiers: *Plowshare operation, *Nuclear stimulation.

The supply of special nuclear material for nuclear explosives might prove to be a limiting factor in the commercial implementation of nuclear stimulation of natural gas. The report presents an analysis of energy and material resources for nuclear gas stimulation, and discusses some of the factors which might influence the successful application of this technology.

PB-231 039/9GA PC$4.50/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT. ENERGY DEVELOPMENT TRENDS,
John C. Bellamy, and Michael C. Penz. Jan 73, 29p NSF-RA-G-73-013
Contract NSF GT-21
See also PB-231 037.

Descriptors: *Nuclear explosions, *Technology assessment, Nuclear power plants, Heating equipment, Natural gas, Oil reserves, Depletion, Environmental surveys.
Identifiers: *Plowshare operation.

An analysis of probable future needs for energy in relation to potential sources of energy and environmental concerns is used to postulate how those needs might best be served. It is thereby postulated that nuclear heating plants can well be developed to serve most of our needs for heat and electrical energy in stationary locations, and that fossil fuels can thereby well be conserved largely for propelling vehicles. It is thereby also seen that nuclear explosives are likely to be needed to extend the use of natural gas for stationary heating needs during the transitional period. (Author)

PB-231 040/7GA PC$4.00/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo.
PLOWSHARE TECHNOLOGY ASSESSMENT. SEISMIC DAMAGE COMPENSATION,
Lynn C. Maxwell, and Hooman Jensbzadeh. Jun 72, 16p NSF-RA-G-73-021
Contract NSF-GT-21
See also PB-231 036.

Descriptors: *Public buildings, *Nuclear explosion effects, *Residential buildings, *Compensation, Damage, Seismic waves, Costs.
Identifiers: *Plowshare operation.

The community in an area surrounding nuclear explosions suffer certain risks and costs from the ground motion resulting from nuclear blasts, such as evacuation and inconvenience to residents, interruptions of public activities, and damage to public property. The report describes a method whereby

the community can be compensated for these costs by a permit fee which is negotiated between the business enterprise using the nuclear explosives and the local governments involved. Compensation from the negotiated permit fee for certain costs incurred would increase the revenue which is available to the local governmental units in the community. The use of a negotiated permit fee would also allow the residents surrounding the nuclear explosion to become active participants in the decision-making process.

PEM-1 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
EMP PROTECTION ENGINEERING: THE NEED FOR DOCUMENTATION.
L. F. Wouters. Mar 72, 8p

Descriptors: (*Electromagnetic pulses, *Documentation), (*Nuclear explosions, Electromagnetic pulses), (*Electronic equipment, *Physical radiation effects), Atmospheric explosions, Reviews.

For abstract, see NSA 29 07, number 15778.

PEM-2 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
EMP DIRECTORY FOR SHELTER DESIGN.
J. E. Bridges, D. A. Miller, and A. R. Valentino. Dec 71, 40p

Descriptors: (*Electromagnetic pulses, Shelters), (*Nuclear explosions, Electromagnetic pulses), (*Electronic equipment, *Physical radiation effects), (*Shelters, *Design), Atmospheric explosions, Shielding.

For abstract, see NSA 29 07, number 15779.

18D. Nuclear Instrumentation

AD-776 951/6GA PC$3.25/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
INVESTIGATION OF POSSIBLE SYNERGISTIC EFFECTS OF NEUTRONS AND PHOTONS IN SELECTED DOSIMETRIC MATERIALS,
John R. Jacobson, and Michael P. Rodgers. Mar 74, 41p Rept no. BRL-1704

Descriptors: *Luminescent dosimeters, *Gamma rays, *Neutrons, Lithium fluorides, Calcium fluorides, Manganese, Doping, Thermoluminescence, Synergism.
Identifiers: Silver phosphites.

An experiment was conducted to investigate the possible existence of a synergistic response in several different dosimetric materials when they are exposed to fast neutrons and gamma rays. Gamma ray exposure data obtained on various nuclear weapon tests indicated the possibility exists that these materials did not respond in an additive manner when exposed to a radiation environment containing both neutrons and photons (gamma rays). The experimental procedure consisted of exposing the dosimeters individually to neutron and gamma rays as well as to a combined neutron and gamma ray environment. The investigation revealed that three of four types of gamma ray exposure dosimeters routinely employed do not respond in a strictly additive manner when exposed to mixed radiation environments. Based on the accepted definition of the word synergism, only LiF thermoluminescent dosimeters (TLD) exhibited a synergistic effect. That is the combined neutron and gamma ray response was greater than the sum of the individual responses for this particular dosimeter. (Modified author abstract)

AEEW-R-910 PC$3.25/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
SMALL PULSE BREAKDOWN PHENOMENON IN MINERAL INSULATED CABLES.
K. W. McMinn. Nov 73, 23p
U.S. Sales Only.

Descriptors: (*Neutron detectors, Electric cables), (*Electric cables, *Breakdown), Dielectric materials, Gases, Minerals, Pulse circuits.

For abstract, see NSA 29 07, number 15673.

AERE-R-7485 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
NUCLEAR ACCIDENT DOSIMETRY. PART I. GENERAL PRINCIPLES.
H. J. Delafield, J. A. Dennis, and J. A. B. Gibson. Nov 73, 40p
U.S. Sales Only.

Descriptors: (*Radiation accidents, *Dosimetry), Activation detectors, Body, Criticality, Dosemeters, Fission foil detectors, Gamma dosimetry, Indium, Neptunium 237, Neutron dosimetry, Personnel dosimetry, Radiation doses, Radioactivity, Threshold detectors.

For abstract, see NSA 29 07, number 15716.

AERE-R-7486 PC$4.50/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
NUCLEAR ACCIDENT DOSIMETRY. PART II. DOSE ASSESSMENT PROCEDURE.
H. J. Delafield, J. A. Dennis, and J. A. B. Gibson. Nov 73, 46p
U.S. Sales Only.

Descriptors: (*Fission foil detectors, *Calibration), (*Activation detectors, Calibration), (*Radiation accidents, *Dosimetry), Body, Clothing, Criticality, Dielectric track detectors, Dosemeters, Gamma dosimetry, Neptunium 237, Neutron dosimetry, Personnel dosimetry, Personnel monitoring, Photographic film dosemeters, Radiation doses, Radiation protection.

For abstract, see NSA 29 07, number 15717.

ANL-8055 PC$7.60/MF$1.45
Argonne National Lab., Ill. (Usa).
STREAMER CHAMBER TECHNOLOGY. PROCEEDINGS OF THE FIRST INTERNATIONAL CONFERENCE, SEPTEMBER 14–15, 1972.
J. M. Watson. 1972, 258p CONF-7209102-
Contract W-31-109-eng-38

Descriptors: (*Streamer spark chambers, *Meetings), Illinois, Proceedings.

For abstract, see NSA 29 07, number 15746.

BNWL-SA-4761 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa); California Univ., Los Angeles (Usa). Lab. Of Nuclear Medicine and Radiation Biology.
BIOMEDICAL PROBE USING A FIBER OPTIC COUPLED SCINTILLATOR.
K. L. Swinth, and J. H. Ewins. 1973, 17p CONF-731123-3
Contract AT(45-1)-1830

Descriptors: (*Solid scintillation detectors, *Performance), (*Lymph nodes, *Radionuclide kinetics), (*Plutonium, *Radiometric analysis), Bronchi, Retention, Sensitivity, Trachea, Uranium, X-ray detection.

For abstract, see NSA 29 07, number 15674.

CEA-CONF-2438 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
GAMMA SPECTROMETER OF THE RADIOACTIVE ENGINEERING DEPARTMENT.
M. Ferre. 1973, 13p CONF-730557-3
In French. U.S. Sales Only.

Descriptors: (*Gamma spectrometers, *Data processing), (*Spent fuels, *Radiometric analysis), Collimators, Data acquisition, Gamma spectra, Li-drifted ge detectors, Reprocessing, Solid scintillation detectors.

For abstract, see NSA 29 07, number 15726.

CEA-N-1659 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
HOT CELL INSTALLATION FOR A MULTICHANNEL SPECTROMETER USED FOR IN SOLUTION X-RAY FLUORESCENCE ANALYSIS.
P. Sarrat, and A. Denis. Oct 73, 19p
In French. U.S. Sales Only.

Descriptors: (*Hot cells, *Design), (*X-ray fluorescence analyzers, Hot cells), Liquids, Radioactive materials, Solids, X-ray fluorescence analysis.

For abstract, see NSA 29 07, number 15785.

COS-9 PC$3.00/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
DEVELOPMENT OF A PORTABLE INSTRUMENT FOR THE MEASUREMENT OF NEUTRONS AND GAMMA RAYS EMITTED FROM NUCLEAR FUEL MATERIALS.
S. H. W. Tarrant, and D. R. Terrey. 15p
U.S. Sales Only.

Descriptors: (*Bf3 counters, *Performance), (*Plutonium 240, *Radiometric analysis), (*Fuel plates, Radiometric analysis), (*Plutonium 239, Radiometric analysis), Gamma spectrometers, Gamma spectroscopy, Neutron detection, Safeguards, Zebra reactor.

For abstract, see NSA 29 07, number 15675.

DESY-73-45 PC$3.75/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
DIDO: A MOST VERSATILE PATTERN-UNIT WITH FAST DISCRIMINATOR-INPUTS AND CAMAC-/PERSEUS-OUTPUT FACILITIES.
H. Quehl, H. J. Stuckenberg, and H. Brechtel. Oct 73, 34p
U.S. Sales Only.

Descriptors: (*Data acquisition systems, *Electronic circuits), Camac system, Coincidence circuits, Multi-channel analyzers, Specifications.

For abstract, see NSA 29 07, number 15786.

EGG-1183-2299 PC$4.00/MF$1.45
Eg and G, Inc., Goleta, Calif. (Usa).
MONTE CARLO CALCULATION OF THE RESPONSE FUNCTION FOR A 4- BY 4-INCH NAI CRYSTAL SCINTILLATION DETECTOR.
A. A. O'Dell. Nov 72, 27p
Contract AT(29-1)-1183

Descriptors: (*Solid scintillation detectors, *Response functions), Computer calculations, Monte carlo method, Simulation, Sodium iodides.

For abstract, see NSA 29 07, number 15677.

EGG-565-120 PC$3.00/MF$1.45
California Univ., Los Angeles (Usa); Eg and G, Inc., Goleta, Calif. (Usa).

PRELIMINARY STUDIES OF CHARGE CARRIER TRANSPORT IN MERCURIC IODIDE RADIATION DETECTORS.
J. Llacer, M. K. Watt, M. Schieber, R. Carlston, and W. Schnepple. 1973, 11p CONF-731112-23

Descriptors: (*Semiconductor detectors, *Performance), Charge carriers, Crystal growth, Electron mobility, Energy resolution, Fabrication, Gamma spectrometers, Hole mobility, Holes, Leakage current, Mercury iodides, Trapping, X-ray spectrometers.

For abstract, see NSA 29 07, number 15676.

FEI-372 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
MEASUREMENT OF THE EFFECTIVENESS OF A TIME-OF-FLIGHT NEUTRON SPECTROMETER.
V. I. Plyaskin, O. A. Salnikov, and V. I. Trykova. 1972, 18p
In Russian. U.S. Sales Only.

Descriptors: (*Neutron spectrometers, Solid scintillation detectors), (*Solid scintillation detectors, *Efficiency), Stilbene, Time-of-flight spectrometers.

For abstract, see NSA 29 07, number 15727.

ITEF-23 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Teoreticheskoj I Ehksperimental'Noj Fiziki.
INCREASE OF PRECISION IN RE-ESTABLISHMENT OF COORDINATES DURING PHOTOGRAPHING THROUGH REFLECTING AND REFRACTING SURFACES.
V. V. Kishkurno, A. P. Krutenkova, V. V. Kulikov, L. P. Nikolaeva, and I. A. Radkevich. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Spark chambers, *Photography), Optical systems.

For abstract, see NSA 29 07, number 15763.

ITEF-25 PC$3.25/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Teoreticheskoj I Ehksperimental'Noj Fiziki.
INVESTIGATION OF THE RE-ESTABLISHMENT OF IMPULSE ELECTRICAL STRENGTH AFTER DISCHARGE IN SPARK CHAMBERS WITH SMALL CLEARANCE.
V. I. Martynov, and V. V. Ryl'tsov. 1973, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Spark chambers, *Operation), Electric discharges, Electric potential, High-voltage pulse generators, Timing properties.

For abstract, see NSA 29 07, number 15764.

JINR-P10-7364 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
EXPRESS PROGRAM FOR PROCESSING SPECTRA (EPOS). DETERMINATION OF THE DEPENDENCE OF THE RESOLVING CAPACITY OF THE DETECTOR ON THE ENERGY.
G. Eler, P. M. Gopych, G. V. Vinel, V. Khabenikht, and L. A. Vylova. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Computer codes, *E codes), (*Spectrometers, *Data processing), Energy dependence.

For abstract, see NSA 29 07, number 15730.

JINR-P10-7365 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
EXPRESS PROGRAM FOR PROCESSING SPECTRA EPOS. ANALYSIS OF THE SPECTRAL REGION WITH COMPLEX BACKGROUND AND CORRECTION OF THE APPARATUS DISTURBANCES IN THE INDIVIDUAL CHANNELS.
G. Eler, P. M. Gopych, G. V. Vinel, V. Khabenikht, and L. A. Vylova. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Computer codes, *E codes), (*Spectrometers, *Data processing), Background radiation, Corrections.

For abstract, see NSA 29 07, number 15731.

JINR-P10-7367 PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
EXPRESS PROGRAM FOR PROCESSING SPECTRA (EPOS) FOR DOUBLET FITTING.
G. Eler, P. M. Golych, G. Vinel, V. Khabenikht, and L. A. Vylova. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Computer codes, *E codes), (*Spectrometers, *Data processing).

For abstract, see NSA 29 07, number 15732.

N74-17430/1GA PC$5.75/MF$1.45
Paris Univ., Orsay (France). Lab. de l'Accelerateur Lineaire.
PROPERTIES OF NINE MULTIWIRE PROPORTIONAL CHAMBER FOR THE EXPERIMENT GAMMA PLUS D YIELDS NEGATIVE PION PLUS P PLUS P PROPRIETES DES NEUF CHAMBRES MULTIFILS PROPORTIONNELLES DE L'EXPERIENCE GAMMA PLUS D PRODUIT PION NEGATIF PLUS P PLUS P.
Ph.D. Thesis.
J. Boucrot. Jun 73, 55p LAL-1267
Language in French.

Descriptors: *Electric wire, *Nuclear reactions, *Nuclear research, *Proportional counters, Coincidence circuits, Electronic packaging, Photoproduction, Printed circuits, Voltage amplifiers.

For abstract, see STAR 1208

N74-17526/6GA PC$0.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SECONDARY ELECTRON BACKGROUND PRODUCED BY HEAVY NUCLEI IN A MULTIWIRE PROPORTIONAL COUNTER HODOSCOPE.
S. H. Morgan, Jr., J. W. Watts, Jr., H. Schwille, and U. Pollvogt. Feb 74, 48p NASA-TN-D-7591, M-462

Descriptors: *Background radiation, *Heavy nuclei, *Hodoscopes, Electron energy, Electrons, Monte carlo method, Proportional counters.

For abstract, see STAR 1208

ORO-2504-186 PC$4.00/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
LARGE VOLUME 96 ELEMENT DIGITIZED NEUTRON DETECTOR. TECHNICAL REPORT NO. 73-021.
W. Aitkenhead, J. Christian, J. H. Crouch, G. LaRue, and M. Lyerly. Aug 73, 38p

Descriptors: (*Neutron detection, *Liquid scintillation detectors), Coincidence circuits, Cross sections, Design, Neutrons, Performance, Pion-proton interactions, Pions, Time-of-flight method.

For abstract, see NSA 29 07, number 15765.

ORO-2843-23 PC$7.50/MF$1.45
Florida Univ., Gainesville (Usa).
DEVELOPMENT AND APPLICATIONS OF THIN FILM DETECTORS. PROGRESS REPORT, JANUARY 1--DECEMBER 31, 1973.
M. L. Muga. 107p
Contract AT(40-1)-2843

Descriptors: (*Solid scintillation detectors, *Research programs), (*Ion detection, Solid scintillation detectors), Energy resolution, Films, Fission fragment detection.

For abstract, see NSA 29 07, number 15679.

RL-73-90 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
SEMINAR ON TECHNIQUES FOR MOMENTUM RECONSTRUCTION.
R. Rosner, and T. G. Walker. 1973, 36p CONF-730732-1
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Data processing), (*Spark chambers, Data processing), Elementary particles, Linear momentum, Magnetic fields, Meetings, Particle tracks, Proceedings, Superconducting magnets, United kingdom.

For abstract, see NSA 29 07, number 15733.

SLA-73-979 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
MOD 3 FAMILY OF PRODUCTION COMPTON DIODES.
M. M. Conrad. Jan 74, 16p
Contract AT(29-1)-789

Descriptors: (*Compton diode detectors, *Specifications), (*Gamma detection, Compton diode detectors).

For abstract, see NSA 29 07, number 15680.

UILU-73-2562 PC$4.00/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Electrical Engineering.
STUDIES OF SILICON EXTRINSIC DETECTORS. SCIENTIFIC REPORT NO. 1.
C. T. Sah. 28 Nov 73, 36p AFCRL-TR-73-737

Descriptors: (*Si semiconductor detectors, *Operation), Electron mobility, N-type conductors, Photoconductivity, Recombination.

For abstract, see NSA 29 07, number 15681.

18E. Nuclear Power Plants

AECL-4429 PC$5.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
PROCEEDINGS OF THE SYMPOSIUM ON CORROSION CONTROL BY DESIGN IN CANDU NUCLEAR POWER REACTORS HELD AT POWER PROJECTS ON OCTOBER 18, 1972.
J. T. N. Atkinson, and J. E. LeSurf. Aug 73, 73p CONF-7210111-
U.S. Sales Only.

Descriptors: (*Bwr type reactors, *Fuel assemblies), (*Pbwr type reactors, Fuel assemblies), (*Reactor cooling systems, *Corrosion), (*Steam generators, Corrosion), Corrosion resistance, Design, Performance, Reactor materials.

For abstract, see NSA 29 07, number 17551.

ANL-CT-73-23 PC$3.75/MF$1.45
Argonne National Lab., Ill. (Usa).
METHOD OF CHARACTERISTICS FOR PRESSURE TRANSIENTS IN CYLINDRICAL

GEOMETRY WITH AXIAL SYMMETRY: THE FORMULATION.
Y. W. Shin. Oct 73, 31p

Descriptors: (*Lmfbr type reactors, Steam generators), (*Steam generators, *Failures), Cylindrical configuration, Fbr type reactors, Heat transfer, Liquid flow, Mathematical models, Transients.

For abstract, see NSA 29 07, number 17571.

BNWL-SA-4846 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ENGINEERING SCALE TEST OF AN FFTF FISSION GAS DELAY BED.
J. L. McElroy, and T. J. Kabele. 12p CONF-731101-49

Descriptors: (*Fftf reactor, *Mockup), Argon 41, Charcoal, Gaseous wastes, Krypton 85, Performance testing, Radioactive waste disposal, Simulation, Xenon 131, Xenon 133.

For abstract, see NSA 29 07, number 17596.

CONF-731039-1 PC$3.00/MF$1.45
Asea-Atom Ab, Vaesteraas (Sweden).
EXPERIENCE ACQUIRED IN THE DESIGN AND CONSTRUCTION OF OPERATING PLANTS.
L. Leine. 9p
U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Construction), (*Sweden, Nuclear power plants), Design.

For abstract, see NSA 29 07, number 17547.

DOCKET-50003-235 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 1. INFORMATION RE METHOD OF MAINTAINING 100% RELATIVE HUMIDITY DURING STEAM/CHEMICAL-SPRAY EXPOSURE TEST.
15 Jan 74, 4p

Descriptors: Humidity, Indian point-1 reactor, Pumps, Steam, Testing.

For abstract, see NSA 29 07, number 17744.

DOCKET-50003-236 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-4-1-1: THE HIGH PRESSURE BORON ADDITION SYSTEM WAS REMOVED FROM SERVICE TO PERMIT DISASSEMBLY AND REPAIR OF VALVE BA-15.
17 Jan 74, 2p

Descriptors: (*Indian point-1 reactor, *Valves), Repair.

For abstract, see NSA 29 07, number 17745.

DOCKET-50003-238 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-4-1-1: INOPERABILITY OF THE HIGH PRESSURE BORON ADDITION SYSTEM.
17 Jan 74, 2p

Descriptors: (*Indian point-1 reactor, *Fluid poison control), Additives, Boric acid, Eccs, Primary coolant circuits, Reactor shutdown, Repair, Tanks, Valves.

For abstract, see NSA 29 07, number 17746.

DOCKET-50003-239 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-4-1-2: FREEZING OF THE IMPULSE LINES TO THE DIFFERENTIAL PRESSURE SENSORS; ABNORMAL OCCURRENCE REPORT NO. AO-4-1-3: FAILURE OF THE DRIVE KEY ON THE NO. 12 MAIN STEAM STOP VALVE MOTOR OPERATOR.
22 Jan 74, 2p

Descriptors: (*Indian point-1 reactor, *Secondary coolant circuits), Failures, Freezing, Pressure gages, Pressure measurement, Valves.

For abstract, see NSA 29 07, number 17747.

DOCKET-50010-211 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT: CORE SPRAY PUMP "B" BREAKER TRIP.
4 Jan 74, 2p

Descriptors: (*Dresden-1 reactor, *Core spray systems), Circuit breakers, Failures, Pumps.

For abstract, see NSA 29 07, number 17748.

DOCKET-50016-218 PC$3.00/MF$1.45
Power Reactor Development CO., Detroit, Mich. (Usa).
ENRICO FERMI ATOMIC POWER PLANT, UNIT 1. QUARTERLY REPORT, OCTOBER--DECEMBER 1973.
17 Dec 73, 13p

Descriptors: (*Enrico fermi-1 reactor, *Reactor dismantling), Atmospheric precipitations, Cleaning, Drinking water, Dusts, Filters, Fires, Fishes, Gaseous wastes, Liquid wastes, Milk, Primary coolant circuits, Radioactive waste disposal, Secondary coolant circuits, Sodium, Stack disposal, Surface waters, Ultrasonic testing.

For abstract, see NSA 29 07, number 17749.

DOCKET-50029-285 PC$3.00/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass. (Usa).
YANKEE NUCLEAR POWER STATION. SAFETY EVALUATION REPORT, RUPTURE OF HIGH ENERGY LINES OUTSIDE OF CONTAINMENT.
13 Dec 73, 5p

Descriptors: (*Rowe yankee reactor, *Reactor accidents), Pipelines, Reactor safety, Ruptures.

For abstract, see NSA 29 07, number 17750.

DOCKET-50029-287 PC$18.25/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass. (Usa).
YANKEE NUCLEAR POWER STATION. LICENSE APPLICATION, FSAR, VOLUME I.
3 Jan 74, 322p

Descriptors: Reactor components, Reactor control systems, Reactor cooling systems, Reactor instrumentation, Reactor sites, Rowe yankee reactor.

For abstract, see NSA 29 07, number 17751.

DOCKET-50029-288 PC$15.50/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass. (Usa).
YANKEE NUCLEAR POWER STATION. LICENSE APPLICATION, FSAR, VOLUME II.
3 Jan 74, 267p

Descriptors: Electric power, Radiation protection, Radioactive waste disposal, Reactor operation, Rowe yankee reactor, Testing, Turbogenerators.

For abstract, see NSA 29 07, number 17752.

DOCKET-50029-289 PC$18.75/MF$1.45
Yankee Atomic Electric CO., Westboro, Mass. (Usa).
YANKEE NUCLEAR POWER STATION. LICENSE APPLICATION, FSAR, VOLUME III.
3 Jan 74, 333p

Descriptors: Quality assurance, Reactor accidents, Rowe yankee reactor, Specifications.

For abstract, see NSA 29 07, number 17753.

DOCKET-50155-187 PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
BIG ROCK POINT NUCLEAR PLANT. INVESTIGATION OF THE EMERGENCY CONDENSER TO DETERMINE THE CAUSE OF THE ACTIVITY IN THE SHELL SIDE WATER.
21 Dec 73, 3p

Descriptors: Big rock point reactor, Leak testing, Leaks, Tubes, Welded joints.

For abstract, see NSA 29 07, number 17754.

DOCKET-50155-188 PC$14.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
BIG ROCK POINT NUCLEAR PLANT. SITE EMERGENCY PLAN.
15 Jan 74, 236p

Descriptors: Big rock point reactor, Education, Management, Personnel, Radiation protection.

For abstract, see NSA 29 07, number 17755.

DOCKET-50155-189 PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
BIG ROCK POINT NUCLEAR PLANT. CORRECTIVE ACTION TAKEN RE EMERGENCY CONDENSER.
17 Jan 74, 7p

Descriptors: (*Big rock point reactor, *Steam condensers), Deformation, Leaks, Plates, Porosity, Repair, Tubes, Welding.

For abstract, see NSA 29 07, number 17756.

DOCKET-50171-138 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 1. ABNORMAL OCCURRENCE: LEAKAGE WAS DETECTED AROUND THE ELECTRICAL CABLES ON THE INNER SEAL.
18 Dec 73, 2p

Descriptors: (*Peach bottom-1 reactor, *Containment), Electric cables, Leak testing, Leaks, Openings, Seals.

For abstract, see NSA 29 07, number 17757.

DOCKET-50206-262 PC$3.00/MF$1.45
Southern California Edison CO., Rosemead (Usa).
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. INCIDENT REPORT: CV-116, THE SPHERE EQUALIZING VALVE, WAS FOUND TO BE LEAKING AROUND THE VALVE SEAT.
14 Jan 74, 2p

Descriptors: (*San onofre-1 reactor, *Containment), Flanges, Inspection, Leaks, Lubrication, Neoprene, Pressure dependence, Spherical configuration, Valves.

For abstract, see NSA 29 07, number 17758.

DOCKET-50213-257 PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., Hartford (Usa).

HADDAM NECK PLANT. ABNORMAL OCCURRENCE REPORT NO. AO-73-13: UNSATISFACTORY TEST OF A MAIN STEAM ISOLATION VALVE.
28 Dec 73, 1p

Descriptors: (*Connecticut yankee reactor, *Valves), Performance testing.

For abstract, see NSA 29 07, number 17759.

DOCKET-50213-261 PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., East Hampton (Usa).
HADDAM NECK PLANT. ABNORMAL OCCURRENCE REPORT NO. AO-74-1: UNSATISFACTORY TEST OF TIMERS ASSOCIATED WITH THE EMERGENCY DIESEL GENERATOR/CORE COOLING SYSTEMS.
18 Jan 74, 2p

Descriptors: (*Connecticut yankee reactor, *Diesel engines), Calibration, Cooling, Failures, Reactor cores, Relays, Timing circuits.

For abstract, see NSA 29 07, number 17760.

DOCKET-50213-263 PC$3.00/MF$1.45
Connecticut Yankee Atomic Power CO., Hartford (Usa).
HADDAM NECK PLANT. ABNORMAL OCCURRENCE REPORT NO. AO-74-3: A SEVERE ICE STORM CAUSED A TOTAL LOSS OF SERVICE STATION POWER.
21 Jan 74, 1p

Descriptors: (*Connecticut yankee reactor, *Electric power), Failures, Ice, Weather.

For abstract, see NSA 29 07, number 17761.

DOCKET-50219-360 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. SUMMARY REPORT ON MAIN STEAM ISOLATION VALVE INSPECTION AND REPAIR.
13 Dec 73, 4p

Descriptors: (*Oyster creek-1 reactor, *Valves), Inspection, Repair.

For abstract, see NSA 29 07, number 17762.

DOCKET-50219-363 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. 73-30: MALFUNCTION OF LOW PRESSURE MAIN STEAM LINE PRESSURE SWITCHES.
6 Dec 73, 4p

Descriptors: (*Oyster creek-1 reactor, *Switches), Calibration, Pressure gages, Reactor protection systems.

For abstract, see NSA 29 07, number 17763.

DOCKET-50219-366 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-74-1: MALFUNCTION OF LOW PRESSURE MAIN STEAM LINE PRESSURE SWITCH (RE23C).
15 Jan 74, 5p

Descriptors: (*Oyster creek-1 reactor, *Switches), Calibration, Testing.

For abstract, see NSA 29 07, number 17764.

DOCKET-50219-367 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-74-3: FAILURE OF HYDRAULIC SHOCK AND SWAY ARRESTORS ON THE SPRAY SYSTEM AND TWO ISOLATION CONDENSER SYSTEMS.
14 Jan 74, 3p

Descriptors: (*Oyster creek-1 reactor, *Core spray systems), Containment, Eccs, Failures, Reactor cores, Seismic effects, Shock absorbers.

For abstract, see NSA 29 07, number 17765.

DOCKET-50219-368 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. 74-5: FAILURE OF MAIN STEAM ISOLATION VALVE NS04A TO MEET ALLOWABLE LEAKAGE REQUIREMENTS.
17 Jan 74, 3p

Descriptors: (*Oyster creek-1 reactor, *Valves), Leaks, Reactor cooling systems, Seals.

For abstract, see NSA 29 07, number 17766.

DOCKET-50219-369 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-74-6: OPERATION OF THE REACTOR WITH AN INADEQUATELY INERTED CONTAINMENT.
23 Jan 74, 4p

Descriptors: (*Oyster creek-1 reactor, *Containment), Inert atmosphere, Reactor operation, Reactor shutdown.

For abstract, see NSA 29 07, number 17767.

DOCKET-50219-370 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. AO-74-7: CHANGE IN SETPOINT OF SENSORS.
23 Jan 74, 3p

Descriptors: (*Oyster creek-1 reactor, *Pressure gages), Calibration, Pressure measurement.

For abstract, see NSA 29 07, number 17768.

DOCKET-50219-373 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. SUMMARY OF ELECTROMATIC RELIEF VALVE OPERATION, JANUARY 1, 1969 TO DECEMBER 31, 1973.
18 Jan 74, 6p

Descriptors: (*Oyster creek-1 reactor, *Valves), Performance testing.

For abstract, see NSA 29 07, number 17769.

DOCKET-50219-378 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. 73-31: INTERRUPTION OF 125V DC POWER SUPPLYING INSTRUMENTATION ASSOCIATED WITH VARIOUS SAFEGUARD SYSTEMS.
13 Dec 73, 5p

Descriptors: (*Oyster creek-1 reactor, *Electric power), Logic circuits, Power supplies, Reactor instrumentation.

For abstract, see NSA 29 07, number 17770.

DOCKET-50219-379 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. 73-32: MALFUNCTION OF MSIV NS04A DURING CLOSURE EXERCISE.
19 Dec 73, 4p

Descriptors: (*Oyster creek-1 reactor, *Valves), Failures, Testing.

For abstract, see NSA 29 07, number 17771.

DOCKET-50219-380 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. THREATENED FAILURE OF RELAY 6K43 IN THE PLANT PROTECTION SYSTEM.
20 Dec 73, 2p

Descriptors: (*Oyster creek-1 reactor, *Reactor protection systems), Failures, Relays, Valves.

For abstract, see NSA 29 07, number 17772.

DOCKET-50219-381 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE: MALFUNCTION OF LOW PRESSURE MAIN STEAM LINE PRESSURE SWITCHES.
24 Dec 73, 2p

Descriptors: (*Oyster creek-1 reactor, *Switches), Calibration, Pressure gages, Reactor protection systems.

For abstract, see NSA 29 07, number 17773.

DOCKET-50219-382 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE: MOMENTARY INTERRUPTION OF 125V DC POWER SUPPLYING INSTRUMENTATION ASSOCIATED WITH VARIOUS SAFEGUARD SYSTEMS.
24 Dec 73, 3p

Descriptors: (*Oyster creek-1 reactor, *Equipment protection devices), Containment spray systems, Diesel engines, Performance, Power supplies, Pumps, Reactor instrumentation, Switches.

For abstract, see NSA 29 07, number 17774.

DOCKET-50219-385 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. 73-34: MALFUNCTION OF MAIN STEAM LINE HIGH RADIATION MONITORS.
27 Dec 73, 3p

Descriptors: (*Oyster creek-1 reactor, *Radiation monitors), Performance.

For abstract, see NSA 29 07, number 17775.

DOCKET-50219-390 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).

OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. INCIDENT REPORT: SPILL OF CHROMATED WATER.
3 Jan 74, 4p

Descriptors: (*Oyster creek-1 reactor, *Radioactive wastes), Accidents, Chromates, Cracks, Freezing, Leaks, Liquid wastes, Pipelines, Tanks, Valves, Waste disposal.

For abstract, see NSA 29 07, number 17776.

DOCKET-50219-391 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT: DRIFT IN SET POINT OF ISOLATION CONDENSER HIGH FLOW SENSORS.
4 Jan 74, 2p

Descriptors: (*Oyster creek-1 reactor, *Pressure gages), Calibration, Pressure dependence.

For abstract, see NSA 29 07, number 17777.

DOCKET-50219-392 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. AO-74-1: MALFUNCTION OF LOW PRESSURE MAIN STEAM LINE PRESSURE SWITCH RE23C.
7 Jan 74, 5p

Descriptors: (*Oyster creek-1 reactor, *Switches), Calibration, Flow rate, Pressure dependence, Steam.

For abstract, see NSA 29 07, number 17778.

DOCKET-50219-393 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE: RESET PROBLEM WITH THE TEST SPOOL VALVE FOR MAIN STEAM ISOLATION VALVE NS04A.
7 Jan 74, 2p

Descriptors: (*Oyster creek-1 reactor, *Valves), Calibration, Failures.

For abstract, see NSA 29 07, number 17779.

DOCKET-50219-394 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. ABNORMAL OCCURRENCE: FAILURE OF MAIN STEAM LINE HIGH RADIATION MONITOR.
9 Jan 74, 2p

Descriptors: (*Oyster creek-1 reactor, *Radiation monitors), Failures, Reactor protection systems.

For abstract, see NSA 29 07, number 17780.

DOCKET-50219-395 PC$3.00/MF$1.45
Jersey Central Power and Light CO., Morristown, N.J. (Usa).
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. PRELIMINARY ABNORMAL OCCURRENCE REPORT NO. AO-74-2: MALFUNCTION OF THE RE22 MAIN STEAM LINE HIGH FLOW SENSORS.
9 Jan 74, 3p

Descriptors: (*Oyster creek-1 reactor, *Flowmeters), Calibration, Failures, Flow rate, Pressure dependence, Steam, Switches.

For abstract, see NSA 29 07, number 17781.

DOCKET-50237-445 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 2. ABNORMAL OCCURRENCES: HPCI DRAIN LINE LEAK AND TORUS LEVEL RESULTING FROM VALVE LINEUP SUBSEQUENT TO REPAIRS.
12 Dec 73, 4p

Descriptors: (*Dresden-2 reactor, *Eccs), Leaks, Performance, Valves, Water.

For abstract, see NSA 29 07, number 17782.

DOCKET-50237-446 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT: MAIN STEAM LINE HIGH FLOW SENSOR FAILURE.
24 Dec 73, 2p

Descriptors: (*Dresden-2 reactor, *Flowmeters), Reactor operation, Valves.

For abstract, see NSA 29 07, number 17783.

DOCKET-50237-448 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3. UNUSUAL OCCURRENCE: A 5-INCH DIAMETER ELECTRICAL PENETRATION BETWEEN THE REACTOR BUILDING AND THE TURBINE BUILDING WAS FOUND OPEN.
11 Jan 74, 3p DOCKET-50249-339

Descriptors: (*Dresden-2 reactor, *Containment), (*Dresden-3 reactor, Containment), Buildings, Electrical equipment, Openings, Seals, Turbines, Valves.

For abstract, see NSA 29 07, number 17784.

DOCKET-50245-324 PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn. (Usa).
MILLSTONE NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-12: LEAKAGE WAS OBSERVED ISSUING FROM THE ISOLATION CONDENSER TUBE NEST BOUNDARY FLANGE.
31 Dec 73, 1p

Descriptors: Cracks, Depressurization, Flanges, Leak testing, Leaks, Liquid penetrant inspection, Millstone-1 reactor, Repair, Seals, Welded joints.

For abstract, see NSA 29 07, number 17785.

DOCKET-50245-325 PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn. (Usa).
MILLSTONE NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-12: A STEAM LEAK WAS DISCOVERED ON ONE OF THE ISOLATION CONDENSER TUBE NEST BOUNDARY FLANGES.
7 Jan 74, 2p

Descriptors: Leaks, Millstone-1 reactor, Repair, Seals, Steam.

For abstract, see NSA 29 07, number 17786.

DOCKET-50247-190 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-3-2-18: MALFUNCTION OF A PRESSURE BISTABLE IN THE SAFETY INJECTION CIRCUITRY.
4 Jan 74, 2p

Descriptors: (*Indian point-2 reactor, *Switches), Calibration, Logic circuits, Pressure measurement, Pressurizers.

For abstract, see NSA 29 07, number 17787.

DOCKET-50247-191 PC$14.50/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. FEEDWATER LINE INCIDENT REPORT.
14 Jan 74, 248p

Descriptors: (*Indian point-2 reactor, *Feedwater), Containment, Pipelines, Reactor accidents, Ruptures, Steam, Steam generators, Valves.

For abstract, see NSA 29 07, number 17788.

DOCKET-50247-192 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-4-2-2: THE LIMITING SAFETY SYSTEM SETTINGS OF CHANNEL I AND III OF THE OVERPOWER DELTA T REACTOR TRIP CIRCUITRY WAS FOUND TO BE BELOW REQUIRED SPECIFICATION.
15 Jan 74, 2p

Descriptors: (*Indian point-2 reactor, *Reactor protection systems), Calibration, Electronic circuits, Power, Temperature measurement.

For abstract, see NSA 29 07, number 17789.

DOCKET-50247-194 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-4-2-1: THE SETTING OF A STEAM LINE PRESSURE BISTABLE ASSOCIATED WITH HIGH STEAM FLOW PROTECTION WAS BELOW SPECIFIED LEVEL.
8 Jan 74, 2p

Descriptors: (*Indian point-2 reactor, *Switches), Calibration, Flow regulators, Secondary coolant circuits.

For abstract, see NSA 29 07, number 17790.

DOCKET-50247-198 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE NO. AO-4-2-1: MALFUNCTION OF A BISTABLE ASSOCIATED WITH HIGH STEAM FLOW PROTECTION.
18 Jan 74, 2p

Descriptors: (*Indian point-2 reactor, *Switches), Calibration, Flow rate, Pressure dependence.

For abstract, see NSA 29 07, number 17791.

DOCKET-50247-199 PC$3.00/MF$1.45
Consolidated Edison CO. Of New York, Inc., New York (Usa).
INDIAN POINT STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-4-2-3: INSPECTION OF ALL BERGEN--PATERSON HYDRAULIC SHOCK AND SWAY ARRESTORS SHOWED THAT ABOUT 350 SNUBBERS DID NOT MEET SPECIFICATIONS.
21 Jan 74, 1p

Descriptors: (*Indian point-2 reactor, *Shock absorbers), Inspection, Performance, Specifications.

For abstract, see NSA 29 07, number 17792.

DOCKET-50249-340 PC$9.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).

DRESDEN NUCLEAR POWER STATION, UNIT 3. REPORT NEDM-13357, ROD OSCILLATOR TESTS.
Sep 73, 140p

Descriptors: (*Dresden-3 reactor, *Pile oscillation techniques), Control elements, Neutron flux, Oscillations, Reactivity, Testing.

For abstract, see NSA 29 07, number 17793.

DOCKET-50249-342 PC$3.00/MF$1.45
Commonwealth Edison CO., Morris, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 3. UNUSUAL EVENT: FAILURE OF LOW PRESSURE COOLANT INJECTION VALVE MO3-1501-11B.
9 Jan 74, 2p

Descriptors: (*Dresden-3 reactor, *Valves), Containment, Eccs, Failures.

For abstract, see NSA 29 07, number 17794.

DOCKET-50249-346 PC$3.00/MF$1.45
Commonwealth Edison CO., Morris, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNIT 3. UNUSUAL EVENT: PRIMARY CONTAINMENT ISOLATION VALVE LEAKAGE.
17 Jan 74, 2p

Descriptors: (*Dresden-3 reactor, *Containment), Flanges, Leaks, Valves.

For abstract, see NSA 29 07, number 17795.

DOCKET-50259-281 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7350W: START CIRCUIT FAILURE ON STANDBY EMERGENCY DIESEL GENERATOR.
3 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Diesel engines), Electronic circuits, Failures.

For abstract, see NSA 29 07, number 17796.

DOCKET-50259-282 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7349W: REACTOR MAIN STEAM RELIEF VALVE PCV-1-18 BELLOWS SEAL LEAKAGE ALARM INDICATING LIGHT INDICATED BELLOWS LEAKAGE.
4 Jan 74, 3p

Descriptors: (*Browns ferry-1 reactor, *Valves), Failures, Leaks, Pneumatic controllers.

For abstract, see NSA 29 07, number 17797.

DOCKET-50259-283 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7345W: HPCI FAILURE.
4 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Eccs), Electric fuses, Failures.

For abstract, see NSA 29 07, number 17798.

DOCKET-50259-286 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ENVIRONMENTAL ABNORMAL OCCURRENCE REPORT BF EAO-7345W THROUGH 741W, FISH IMPINGEMENT ESTIMATES.
7 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Fishes), Mortality.

For abstract, see NSA 29 07, number 17799.

DOCKET-50259-291 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7352W: MALFUNCTION OF RECIRCULATION PUMP A D/P INDICATING SWITCH.
14 Jan 74, 3p

Descriptors: (*Browns ferry-1 reactor, *Reactor cooling systems), Calibration, Eccs, Electric contacts, Pressure gages, Pumps, Relays, Switches.

For abstract, see NSA 29 07, number 17800.

DOCKET-50259-293 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-7351W: MALFUNCTION OF FCV 77-2A INBOARD DRYWELL ISOLATION VALVE.
9 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Containment shells), Failures, Valves.

For abstract, see NSA 29 07, number 17801.

DOCKET-50259-294 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-741W: MALFUNCTION OF REACTOR WATER LEVEL SWITCH.
15 Jan 74, 3p

Descriptors: (*Browns ferry-1 reactor, *Reactor protection systems), Calibration, Levels, Operation, Reactor cooling systems, Switches, Turbines, Water.

For abstract, see NSA 29 07, number 17802.

DOCKET-50259-295 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-742W: MALFUNCTION OF FCV 1-26 AND FCV 1-51 MAIN STEAM INBOARD ISOLATION VALVES.
17 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Valves), Failures.

For abstract, see NSA 29 07, number 17803.

DOCKET-50259-296 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-743W: LPCI BREAK DETECTION PRESSURE SWITCHES NOT IN SERVICE.
17 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Eccs), Failures, Pressure gages, Switches.

For abstract, see NSA 29 07, number 17804.

DOCKET-50259-297 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ENVIRONMENTAL ABNORMAL OCCURRENCE REPORT EAO-742W THROUGH 747W: FISH IMPINGEMENT ESTIMATES.
17 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Fishes), Mortality.

For abstract, see NSA 29 07, number 17805.

DOCKET-50259-305 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT BFAO-744W: START SYSTEM FAILURE ON THE STANDBY DIESEL ENGINE.
25 Jan 74, 2p

Descriptors: (*Browns ferry-1 reactor, *Diesel engines), Electric power, Failures.

For abstract, see NSA 29 07, number 17806.

DOCKET-50259-306 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNITS 1, 2, AND 3. ABNORMAL OCCURRENCE REPORT BFAO-7343W: CORRESPONDENCE RE THE STATUS OF THE TORUS PROBLEM.
28 Jan 74, 6p DOCKET-50260-143, DOCKET-50296-128

Descriptors: (*Browns ferry-1 reactor, *Containment), (*Browns ferry-2 reactor, Containment), (*Browns ferry-3 reactor, Containment), Fabrication, Mechanical vibrations, Nozzles, Reactor start-up, Supports, Valves.

For abstract, see NSA 29 07, number 17807.

DOCKET-50260-138 PC$3.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
BROWNS FERRY NUCLEAR POWER STATION, UNIT 2 AND 3. INTERIM REPORT ON A DESIGN DEFICIENCY IN THE CONTROL LOGIC OF HPCI AND RCIC SYSTEMS.
18 Dec 73, 2p DOCKET-50296-123

Descriptors: (*Browns ferry-2 reactor, *Eccs), (*Browns ferry-3 reactor, Eccs), Defects, Logic circuits.

For abstract, see NSA 29 07, number 17808.

DOCKET-50261-298 PC$4.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-73-72: MALFUNCTION OF REACTOR TRIP BREAKER "B".
31 Dec 73, 4p

Descriptors: (*Robinson-2 reactor, *Circuit breakers), Failures, Reactor shutdown.

For abstract, see NSA 29 07, number 17809.

DOCKET-50261-299 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. ADDITIONAL INFORMATION CONCERNING LOSS-OF-COOLANT ANALYSES.
2 Jan 74, 12p

Descriptors: (*Robinson-2 reactor, *Loss of coolant), Distribution, Heat transfer, Neutron flux, Power density.

For abstract, see NSA 29 07, number 17810.

DOCKET-50261-300 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. SIGNIFICANT EVENT: DEFLECTION OF MAIN STEAM LINE SEISMIC RESTRAINT AP-1

RESULTED IN LOOSENING OF A SMALL AMOUNT OF GROUTING AROUND RESTRAINT ANCHOR PLATE AND MISALIGNMENT OF RESTRAINT.
4 Jan 74, 3p

Descriptors: Deformation, Failures, Motion, Robinson-2 reactor.

For abstract, see NSA 29 07, number 17811.

DOCKET-50261-302 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-74-1: DILUTION OF THE BORON INJECTION TANK AND "B" BORIC ACID STORAGE TANK.
10 Jan 74, 7p

Descriptors: Boric acid, Dilution, Robinson-2 reactor, Tanks.

For abstract, see NSA 29 07, number 17812.

DOCKET-50261-303 PC$9.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. REPORTS ON THE ANALYSIS OF THE FIRST PRESSURE VESSEL SURVEILLANCE CAPSULE AND CORRESPONDENCE.
20 Dec 73, 137p

Descriptors: (*Robinson-2 reactor, *Pressure vessels), Embrittlement, Inspection, Neutron flux, Physical radiation effects.

For abstract, see NSA 29 07, number 17813.

DOCKET-50261-304 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. ABNORMAL OCCURRENCE REPORT: THE LIMITS FOR TWO REPRESENTATIVE THIMBLES WERE INADVERTENTLY CHANGED DURING A PERIOD WHEN MAINTENANCE WAS BEING PERFORMED ON THE PLANT COMPUTER'S MEMORY CORE.
17 Jan 74, 1p

Descriptors: (*Robinson-2 reactor, *Power density), Calibration, Computers, Containers, Control elements, Memory devices, On-line control systems, Power, Reactor cores.

For abstract, see NSA 29 07, number 17814.

DOCKET-50261-305 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
H. B. ROBINSON PLANT, UNIT 2. INCIDENT REPORT: CORRESPONDENCE SUMMARIZING EVENTS THAT TRANSPIRED FOLLOWING PRIMARY TO SECONDARY LEAKAGE IN STEAM GENERATOR C.
17 Jan 74, 3p

Descriptors: (*Robinson-2 reactor, *Steam generators), Leaks, Primary coolant circuits, Repair, Secondary coolant circuits, Tubes.

For abstract, see NSA 29 07, number 17815.

DOCKET-50267-100 PC$3.00/MF$1.45
Public Service CO. Of Colorado, Denver (Usa).
FORT ST. VRAIN NUCLEAR GENERATING STATION. REFLECTOR ELEMENTS FOR LAYER TWO OF THE REACTOR DID NOT MEET SPECIFICATIONS.
14 Jan 74, 1p

Descriptors: (*Vrain reactor, *Neutron reflectors), Defects, Graphite, Specifications.

For abstract, see NSA 29 07, number 17816.

DOCKET-50267-101 PC$3.00/MF$1.45
Public Service CO. Of Colorado, Denver (Usa).
FORT ST. VRAIN NUCLEAR GENERATING STATION. DATA ON INSPECTION OF METAL CLAD KEYED TOP REFLECTOR ELEMENTS.
14 Jan 74, 1p

Descriptors: (*Vrain reactor, *Neutron reflectors), Defects, Inspection, Specifications.

For abstract, see NSA 29 07, number 17817.

DOCKET-50267-102 PC$3.00/MF$1.45
Public Service CO. Of Colorado, Denver (Usa).
FORT ST. VRAIN NUCLEAR GENERATING STATION. FUEL DISCREPANCIES FOUND DURING FUEL LOADING.
14 Jan 74, 1p

Descriptors: (*Vrain reactor, *Fuel elements), Defects, Reactor fueling.

For abstract, see NSA 29 07, number 17818.

DOCKET-50269-185 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNIT 1. UNUSUAL EVENT REPORT NO. 73-13: MALFUNCTION OF REACTOR BUILDING ISOLATION VALVE LP-17.
4 Jan 74, 2p

Descriptors: (*Oconee-1 reactor, *Valves), Electric fuses, Failures.

For abstract, see NSA 29 07, number 17819.

DOCKET-50269-187 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNIT 1. UNUSUAL EVENT REPORT UE-73-14: MALFUNCTION OF ENGINEERED SAFEGUARD VALVE RC-7, A PNEUMATIC OPERATED REACTOR BUILDING ISOLATION VALVE IN THE PRESSURIZER SAMPLE LINE.
7 Jan 74, 2p

Descriptors: (*Oconee-1 reactor, *Valves), Containment, Failures, Performance, Pressurizers, Sampling.

For abstract, see NSA 29 07, number 17820.

DOCKET-50269-189 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNITS 1 AND 2. UNUSUAL EVENT: 230 KV SWITCHYARD ISOLATION.
14 Jan 74, 3p DOCKET-50270-153

Descriptors: (*Oconee-1 reactor, *Electric power), (*Oconee-2 reactor, Electric power), Circuit breakers, Electric cables, Equipment protection devices, Failures, Power transmission, Relays.

For abstract, see NSA 29 07, number 17821.

DOCKET-50270-151 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNIT 2. INFORMATION SUPPORTING THE CONTINUED OPERATION WITH INDICATED PRESENCE OF A LOOSE OBJECT IN THE LOWER REACTOR VESSEL HEAD.
10 Jan 74, 5p

Descriptors: Oconee-2 reactor, Pressure vessels, Reactor operation.

For abstract, see NSA 29 07, number 17822.

DOCKET-50270-154 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-74-1: REACTOR COOLANT SYSTEM COOLDOWN LIMITATIONS.
17 Jan 74, 4p

Descriptors: (*Oconee-2 reactor, *Reactor cooling systems), Cooling, Feedwater, Primary coolant circuits, Pumps, Reactor shutdown, Temperature dependence, Temperature gradients.

For abstract, see NSA 29 07, number 17823.

DOCKET-50270-157 PC$3.00/MF$1.45
Duke Power CO., Charlotte, N.C. (Usa).
OCONEE NUCLEAR STATION, UNIT 2. REACTOR VESSEL INTERNALS INSPECTION FOLLOWING HOT FUNCTIONAL TESTING.
25 Jan 74, 8p

Descriptors: Inspection, Mechanical vibrations, Oconee-2 reactor, Reactor cores, Supports, Testing.

For abstract, see NSA 29 07, number 17824.

DOCKET-50271-263 PC$3.00/MF$1.45
Vermont Yankee Nuclear Power Corp., Rutland (Usa).
VERMONT YANKEE NUCLEAR POWER STATION. ABNORMAL OCCURRENCE REPORT NO. AO-73-32: FAILURE OF BOTH GASKETS ON THE GLAND SEAL EXHAUST CONDENSER OF THE HPCI SYSTEM PUMP.
20 Nov 73, 1p

Descriptors: (*Vermont yankee reactor, *Gaskets), Failures.

For abstract, see NSA 29 07, number 17825.

DOCKET-50272-95 PC$5.00/MF$1.45
Public Service Electric and Gas CO., Newark, N.J. (Usa).
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. AEC SAFETY EVALUATION.
16 Jul 68, 59p DOCKET-50311-85

Descriptors: (*Salem-1 reactor, *Reactor safety), (*Salem-2 reactor, Reactor safety), Additives, Boric acid, Core spray systems, Design, Eccs, Electric power, Reactor cores, Reactor instrumentation, Reactor sites.

For abstract, see NSA 29 07, number 17826.

DOCKET-50277-172 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT: UNEXPLAINED TRIPPING OF THE RCIC TURBINE DURING STARTUP TESTING.
2 Jan 74, 2p

Descriptors: (*Peach bottom-2 reactor, *Turbines), Eccs, Failures, Reactor cooling systems, Reactor start-up, Valves.

For abstract, see NSA 29 07, number 17827.

DOCKET-50277-174 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. PRELIMINARY ABNORMAL OCCURRENCE REPORT: MALFUNCTION OF SWITCHES LIS-2-2-3-101C AND PS-2-5-11A AND D.
7 Jan 74, 1p

Descriptors: (*Peach bottom-2 reactor, *Switches), Levels, Logic circuits, Performance, Reactor cooling systems, Turbines, Water.

For abstract, see NSA 29 07, number 17828.

DOCKET-50277-175 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT: LEAKAGE FROM THE PRIMARY CONTAINMENT TO THE REACTOR BUILDING.
8 Jan 74, 3p

Descriptors: (*Peach bottom-2 reactor, *Containment), Leak testing, Leaks, Personnel, Pressure vessels, Radioactivity, Testing, Valves, Ventilation.

For abstract, see NSA 29 07, number 17829.

DOCKET-50277-177 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ABNORMAL OCCURRENCE: MALFUNCTION OF SWITCHES LIS-2-2-3-101C AND PS-2-5-11A AND D.
15 Jan 74, 3p

Descriptors: (*Peach bottom-2 reactor, *Reactor cooling systems), Calibration, Levels, Logic circuits, Pressure gages, Scram, Switches, Turbines, Water.

For abstract, see NSA 29 07, number 17830.

DOCKET-50277-179 PC$3.00/MF$1.45
Philadelphia Electric CO., PA. (Usa).
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-74-2: FAILURE OF THE LIS-2-3-231D SWITCH WHICH PROVIDES A SCRAM DISCHARGE VOLUME HIGH LEVEL TRIP INPUT TO THE RPS LOGIC.
17 Jan 74, 2p

Descriptors: (*Peach bottom-2 reactor, *Reactor protection systems), Control rod drives, Failures, Leaks, Logic circuits, Switches, Valves.

For abstract, see NSA 29 07, number 17831.

DOCKET-50280-205 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-S1-73-16: LOSS OF OVERHEAD GAS SYSTEM PRESSURE.
19 Dec 73, 9p

Descriptors: (*Surry-1 reactor, *Containment), Charcoal, Compressors, Filters, Maintenance, Off-gas systems, Pressure dependence, Primary coolant circuits, Pumps, Radiation monitors, Solenoids, Stack disposal, Tanks, Valves.

For abstract, see NSA 29 07, number 17832.

DOCKET-50280-206 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNITS 1 AND 2. UNUSUAL SAFETY RELATED EVENT REPORT NO. USRE-S1-73-04: DESIGN PROBLEMS IN THE CLS SYSTEM PRESSURE SENSING SYSTEM.
19 Dec 73, 7p DOCKET-50281-168

Descriptors: (*Surry-1 reactor, *Containment systems), (*Surry-2 reactor, Containment systems), Configuration, Design, Electronic equipment, Leak detectors, Pressure dependence, Pressure gages, Valves.

For abstract, see NSA 29 07, number 17833.

DOCKET-50280-207 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNITS 1 AND 2. REPORT ON A REACTOR COOLANT PUMP SHAFT FAILURE.
9 Jan 74, 10p DOCKET-50281-170

Descriptors: (*Surry-1 reactor, *Primary coolant circuits), (*Surry-2 reactor, *Reactor operation), Departure nucleate boiling, Failures, Fuel elements, Power, Pumps, Rotors.

For abstract, see NSA 29 07, number 17834.

DOCKET-50280-208 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNIT 1. UNUSUAL SAFETY RELATED EVENT: FAILURE OF THE PRIMARY LOOP B STOP VALVE.
17 Jan 74, 1p

Descriptors: (*Surry-1 reactor, *Primary coolant circuits), Failures, Pumps, Valves.

For abstract, see NSA 29 07, number 17835.

DOCKET-50281-169 PC$3.00/MF$1.45
Virginia Electric and Power CO., Richmond (Usa).
SURRY POWER STATION, UNIT 2. ABNORMAL OCCURRENCE REPORT NO. AO-S2-73-12: VIOLATION OF CONTAINMENT INTEGRITY WHEN THE EMERGENCY ACCESS HATCH IN THE INNER ACCESS DOOR OF THE PERSONNEL AIR LOCK OPENED WHILE THE OUTER DOOR WAS OPENED.
20 Dec 73, 2p

Descriptors: (*Surry-2 reactor, *Containment), Doors, Industrial accidents, Openings, Personnel.

For abstract, see NSA 29 07, number 17836.

DOCKET-50282-193 PC$39.75/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. ENVIRONMENTAL MONITORING AND ECOLOGICAL STUDIES PROGRAM, ANNUAL REPORT, 1972.
Oct 73, 754p DOCKET-50306-152

Descriptors: (*Prairie island-1 reactor, *Environment), (*Prairie island-2 reactor, Environment), Air, Aquatic ecosystems, Background radiation, Ecology, Fallout, Fishes, Milk, Mississippi river, Radiation monitoring, Sediments, Soils, Surface waters, Thermal pollution, Water.

For abstract, see NSA 29 07, number 17837.

DOCKET-50282-198 PC$3.00/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT: INCORRECT CONTAINMENT SPRAY CAUSTIC ADDITION SYSTEM VALVE LINEUP.
4 Jan 74, 1p

Descriptors: (*Prairie island-1 reactor, *Containment spray systems), Additives, Equipment protection devices, Performance, Valves.

For abstract, see NSA 29 07, number 17838.

DOCKET-50285-151 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. UNUSUAL EVENT REPORT NO. 73-12: CRACKS IN COMPONENT COOLING WATER PUMP IMPELLERS.
17 Dec 73, 6p

Descriptors: (*Calhoun-1 reactor, *Pumps), Auxiliary water systems, Cooling, Cracks, Reactor components, Repair, Rotors, Seals.

For abstract, see NSA 29 07, number 17839.

DOCKET-50285-153 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. 73-6: DIESEL GENERATOR (D-1) STARTING FAILURE.
13 Dec 73, 3p

Descriptors: (*Calhoun-1 reactor, *Diesel engines), Cleaning, Electric power, Failures, Lubricating oils, Motors.

For abstract, see NSA 29 07, number 17840.

DOCKET-50285-161 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. ADDITIONAL INFORMATION ON THE STEAM LINE VIBRATION PROBLEM.
31 Dec 73, 2p

Descriptors: (*Calhoun-1 reactor, *Secondary coolant circuits), Mechanical vibrations.

For abstract, see NSA 29 07, number 17841.

DOCKET-50285-162 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. 73-8: MALFUNCTION OF MAIN STEAM ISOLATION VALVE HCV-1041A.
2 Jan 74, 3p

Descriptors: (*Calhoun-1 reactor, *Valves), Calibration, Failures, Reactor cooling systems, Reactor protection systems, Relays, Secondary coolant circuits, Solenoids.

For abstract, see NSA 29 07, number 17842.

DOCKET-50285-163 PC$3.75/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. ENVIRONMENTAL RADIOACTIVITY SURVEILLANCE PROGRAM PRE-OPERATIONAL REPORT, SECOND QUARTER, 1973.
1973, 35p

Descriptors: (*Calhoun-1 reactor, *Environment), Air, Aquatic ecosystems, Background radiation, Beryllium 7, Beta particles, Cesium 137, Fallout, Fishes, Gamma radiation, Iodine 131, Milk, Potassium 40, Radium 226, Strontium 90, Surface waters, Tritium.

For abstract, see NSA 29 07, number 17843.

DOCKET-50285-164 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT: FAILURE OF DIESEL GENERATORS.
10 Jan 74, 2p

Descriptors: (*Calhoun-1 reactor, *Diesel engines), Electric power, Failures, Heaters, Lubricating oils, Pressure dependence, Temperature dependence.

For abstract, see NSA 29 07, number 17844.

DOCKET-50285-167 PC$3.00/MF$1.45
Omaha Public Power District, Nebr. (Usa).
FORT CALHOUN STATION, UNIT 1. REACTOR COOLANT FLOW EVALUATION.
17 Jan 74, 16p

Descriptors: (*Calhoun-1 reactor, *Primary coolant circuits), Fluid flow, Performance, Reactor cores.

For abstract, see NSA 29 07, number 17845.

DOCKET-50289-149 PC$3.00/MF$1.45
Metropolitan Edison CO., Reading, PA. (Usa).

THREE MILE ISLAND NUCLEAR STATION, UNIT 1. INCIDENT REPORT: DISCREPANCIES NOTED BETWEEN PHYSICAL CABLE COUNT AND THE CABLE TRAY LOADING SUMMARY QUANTITIES.
12 Dec 73, 3p

Descriptors: (*Three mile island-1 reactor, *Electric cables), Inspection.

For abstract, see NSA 29 07, number 17846.

DOCKET-50293-215 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. UNUSUAL OCCURRENCE REPORT NO. 73-19: FAILURE OF THE INVERTER FOR THE RCIC SYSTEM.
10 Dec 73, 1p

Descriptors: (*Pilgrim-1 reactor, *Electronic equipment), Electric power, Failures, Performance, Reactor cooling systems, Reactor cores.

For abstract, see NSA 29 07, number 17847.

DOCKET-50293-216 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. UNUSUAL OCCURRENCE REPORT NO. UO-73-20: MALFUNCTION OF CONTAINMENT SPRAY VALVE MO-1001-23A.
20 Dec 73, 1p

Descriptors: (*Pilgrim-1 reactor, *Containment spray systems), Containment, Performance, Switches, Valves.

For abstract, see NSA 29 07, number 17848.

DOCKET-50293-217 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-39: MALFUNCTION OF A BARTON MODEL 288A DIFFERENTIAL PRESSURE INDICATING SWITCH.
21 Dec 73, 1p

Descriptors: (*Pilgrim-1 reactor, *Pressure gages), Calibration, Control rod drives, Control systems, Core spray systems, Electronic equipment, Mechanical vibrations, Pipelines, Switches.

For abstract, see NSA 29 07, number 17849.

DOCKET-50293-219 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-73-29: MALFUNCTION OF BARTON MODEL 288A DIFFERENTIAL PRESSURE INDICATING SWITCH.
15 Dec 73, 1p

Descriptors: (*Pilgrim-1 reactor, *Core spray systems), Calibration, Failures, Pressure dependence, Pressure gages, Switches.

For abstract, see NSA 29 07, number 17850.

DOCKET-50293-222 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. PROGRESS REPORT ON DETERMINING MINIMUM RATES AND DURATION OF SODIUM HYPOCHLORITE ADDITION.
7 Jan 74, 11p

Descriptors: (*Pilgrim-1 reactor, *Reactor cooling systems), Auxiliary water systems, Chlorination, Chlorine, Nonradioactive wastes, Steam condensers, Waste disposal, Waste management.

For abstract, see NSA 29 07, number 17851.

DOCKET-50293-223 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE REPORT NO. AO-74-1: THE GENERAL PURPOSE GRAPPLE BECAME DETACHED DURING REFUELING ACTIVITIES IN THE SPENT FUEL POOL.
11 Jan 74, 2p

Descriptors: (*Pilgrim-1 reactor, *Cranes), Failures, Grabs, Reactor fueling, Spent fuel elements.

For abstract, see NSA 29 07, number 17852.

DOCKET-50293-224 PC$3.00/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE NO. AO-74-2: WHILE TRANSFERRING AN IRRADIATED FUEL BUNDLE, THE REFUELING GRAPPLE LOWERED AND THE FUEL BUNDLE BUMPED INTO THE SIDE OF THE REACTOR VESSEL.
14 Jan 74, 1p

Descriptors: (*Pilgrim-1 reactor, *Spent fuels), Control, Cranes, Grabs, Personnel, Pressure vessels, Radiation doses, Reactor fueling, Remote handling, Switches.

For abstract, see NSA 29 07, number 17853.

DOCKET-50295-221 PC$4.25/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
ZION NUCLEAR PLANT, UNIT 1. SPECIAL REPORT NO. 4, POST-TENSIONING SYSTEM INITIAL SURVEILLANCE.
5 Dec 73, 41p

Descriptors: (*Zion-1 reactor, *Containment shells), Inspection, Stress analysis, Testing.

For abstract, see NSA 29 07, number 17854.

DOCKET-50295-224 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
ZION NUCLEAR PLANT, UNIT 1. REPORT NO. 1C, MAIN STEAM LINE CHECK VALVE DIFFERENTIAL PRESSURE EXCEEDING 35 PSID, AND APPENDIX A.
24 Dec 73, 8p

Descriptors: (*Zion-1 reactor, *Secondary coolant circuits), Cracks, Failures, Performance, Valves, Welded joints.

For abstract, see NSA 29 07, number 17855.

DOCKET-50295-226 PC$10.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
ZION NUCLEAR PLANT, UNITS 1 AND 2. FISH POPULATION STUDY PROGRAM.
7 Jan 74, 158p DOCKET-50304-145

Descriptors: (*Zion-1 reactor, *Fishes), (*Zion-2 reactor, Fishes), Environment, Lake michigan, Monitoring, Sampling, Thermal pollution.

For abstract, see NSA 29 07, number 17856.

DOCKET-50295-229 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
ZION NUCLEAR PLANT, UNITS 1 AND 2. ABNORMAL OCCURRENCE REPORT: MALFUNCTION OF DIESEL GENERATOR O FEEDBREAKER.
14 Jan 74, 3p DOCKET-50304-148

Descriptors: (*Zion-1 reactor, *Diesel engines), (*Zion-2 reactor, Diesel engines), Failures, Relays.

For abstract, see NSA 29 07, number 17857.

DOCKET-50295-230 PC$3.00/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
ZION NUCLEAR PLANT, UNIT 1. SPECIAL REPORT NO. 5, POWER DISTRIBUTION ANOMALIES IN LOW POWER TESTS.
16 Jan 74, 19p

Descriptors: (*Zion-1 reactor, *Power density), Distribution, Reactor lattice parameters, Testing.

For abstract, see NSA 29 07, number 17858.

DOCKET-50295-233 PC$3.00/MF$1.45
Commonwealth Edison CO., Zion, Ill. (Usa).
ZION NUCLEAR PLANT, UNIT 1. ABNORMAL OCCURRENCE REPORT: SAFETY INJECTION ACTUATION.
18 Jan 74, 3p

Descriptors: (*Zion-1 reactor, *Eccs), Failures, Pressure dependence, Secondary coolant circuits, Valves.

For abstract, see NSA 29 07, number 17859.

DOCKET-50302-112 PC$3.00/MF$1.45
Florida Power Corp., St. Petersburg (Usa).
CRYSTAL RIVER NUCLEAR PLANT, UNIT 3. REPORT ON NONCONFORMANCE WHICH OCCURRED DURING THE INSTALLATION OF NUCLEAR SERVICE SEA WATER PIPING.
17 Jan 74, 2p

Descriptors: (*Crystal river-3 reactor, *Pipelines), Auxiliary water systems, Defects, Seawater.

For abstract, see NSA 29 07, number 17860.

DOCKET-50305-143 PC$3.00/MF$1.45
Wisconsin Public Service Corp., Green Bay (Usa).
KEWAUNEE NUCLEAR POWER PLANT. FINAL REPORT ON LIGHTNING PROTECTION.
15 Jan 74, 3p

Descriptors: (*Kewaunee reactor, *Lightning arresters), Control systems, Electric cables, Lightning.

For abstract, see NSA 29 07, number 17861.

DOCKET-50305-144 PC$3.00/MF$1.45
Wisconsin Public Service Corp., Green Bay (Usa).
KEWAUNEE NUCLEAR POWER PLANT. FINAL REPORT ON PROBLEMS EXPERIENCED WITH THE 4 KV CIRCUIT BREAKERS.
22 Jan 74, 3p

Descriptors: (*Kewaunee reactor, *Circuit breakers), Electric cables, Electric contacts, Electric power, Switches.

For abstract, see NSA 29 07, number 17862.

DOCKET-50309-168 PC$3.00/MF$1.45
Maine Yankee Atomic Power CO., Westboro, Mass. (Usa).
MAINE YANKEE ATOMIC POWER PLANT. ABNORMAL OCCURRENCE REPORT NO. AO-74-1: MALFUNCTION OF PRESSURE SWITCHES ON THE HIGH CONTAINMENT PRESSURE PROTECTIVE CHANNELS.
4 Jan 74, 1p

Descriptors: (*Maine yankee reactor, *Containment), Calibration, Pressure dependence, Pressure gages, Switches.

For abstract, see NSA 29 07, number 17863.

DOCKET-50317-146 PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD. (Usa).

CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. INTERIM REPORT ON A SIGNIFICANT DEFICIENCY: PLANT ELECTRIC SERVICE SUPPLY FAILURE.
11 Jan 74, 3p DOCKET-50318-124

Descriptors: (*Calvert cliffs-1 reactor, *Power supplies), (*Calvert cliffs-2 reactor, Power supplies), Diesel engines, Electric batteries, Electric cables, Electric power, Failures, Transformers.

For abstract, see NSA 29 07, number 17864.

DOCKET-50317-147 PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD. (Usa).
CALVERT CLIFFS NUCLEAR PLANT, UNITS 1 AND 2. INTERIM REPORT ON SIGNIFICANT DEFICIENCY, MISSING DRIVE KEY IN BUTTERFLY VALVE DRIVE ARM.
11 Jan 74, 3p DOCKET-50318-125

Descriptors: (*Calvert cliffs-1 reactor, *Valves), (*Calvert cliffs-2 reactor, Valves), Auxiliary water systems, Control systems, Defects, Seawater.

For abstract, see NSA 29 07, number 17865.

DOCKET-50317-150 PC$3.00/MF$1.45
Baltimore Gas and Electric CO., MD. (Usa).
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL SIGNIFICANT DEFICIENCY REPORT: USE OF UNACCEPTABLE THERMOCOUPLE WELL MATERIAL.
14 Jan 74, 3p DOCKET-50318-128

Descriptors: (*Calvert cliffs-1 reactor, *Thermocouples), (*Calvert cliffs-2 reactor, Thermocouples), Boric acid, Chromium alloys, Containers, Molybdenum alloys, Pressure dependence, Reactor materials, Stainless steels, Steels, Temperature dependence.

For abstract, see NSA 29 07, number 17866.

DOCKET-50324-130 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2. FINAL REPORT ON CONTROL ROD BLADE INVERTED ABSORBER AND CORRESPONDENCE.
26 Dec 73, 4p DOCKET-50325-128

Descriptors: (*Brunswick-1 reactor, *Control elements), (*Brunswick-2 reactor, Control elements), Defects, Inspection, Repair.

For abstract, see NSA 29 07, number 17867.

DOCKET-50324-135 PC$3.00/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2. INCIDENT REPORT: MISMATCH OF VALVE ACTUATORS.
14 Jan 74, 2p DOCKET-50325-132

Descriptors: (*Brunswick-1 reactor, *Feedwater heaters), (*Brunswick-2 reactor, Feedwater heaters), Calibration, Performance, Valves.

For abstract, see NSA 29 07, number 17868.

DOCKET-50327-68 PC$22.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2. LICENSE APPLICATION, FSAR, VOLUME 8.
1973, 397p DOCKET-50328-61

Descriptors: Documentation, Education, Gaseous wastes, Industrial plants, Liquid wastes, Radiation monitoring, Radiation protection, Radioactive waste disposal, Reactor operation, Security, Sequoyah-1 reactor, Sequoyah-2 reactor, Shielding, Solid wastes, Ventilation.

For abstract, see NSA 29 07, number 17869.

DOCKET-50327-69 PC$22.00/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2. LICENSE APPLICATION, TECHNICAL SPECIFICATIONS.
1973, 398p DOCKET-50328-62

Descriptors: Containment, Control, Design, Fuel elements, Inspection, Management, Reactor operation, Reactor sites, Safety, Sequoyah-1 reactor, Sequoyah-2 reactor, Specifications, Storage.

For abstract, see NSA 29 07, number 17870.

DOCKET-50327-70 PC$34.50/MF$1.45
Tennessee Valley Authority, Chattanooga (Usa).
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2. LICENSE APPLICATION, FSAR, VOLUME 7.
1973, 647p DOCKET-50328-63

Descriptors: Sequoyah-1 reactor, Sequoyah-2 reactor, Turbogenerators.

For abstract, see NSA 29 07, number 17871.

DOCKET-50329-60 PC$3.00/MF$1.45
Consumers Power CO., Jackson, Mich. (Usa).
MIDLAND PLANT, UNITS 1 AND 2. DEFICIENCIES IN THE CADWELDING QUALITY ASSURANCE PROGRAM.
10 Dec 73, 3p DOCKET-50330-59

Descriptors: (*Midland-1 reactor, *Welded joints), (*Midland-2 reactor, Welded joints), Quality assurance, Welding.

For abstract, see NSA 29 07, number 17872.

DOCKET-50336-104 PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn. (Usa).
MILLSTONE NUCLEAR POWER STATION, UNIT 2. FINAL REPORT FOR DEFICIENCY REPORT NO. 6, EXAMINATION OF VELAN VALVE BONNETS.
30 Nov 73, 3p

Descriptors: (*Millstone-2 reactor, *Valves), Construction, Inspection, Quality assurance.

For abstract, see NSA 29 07, number 17873.

DOCKET-50382-86 PC$4.00/MF$1.45
Louisiana Power and Light CO., New Orleans (Usa).
WATERFORD STATION, UNIT 3. LICENSE APPLICATION, ENVIRONMENTAL REPORT, SUPPLEMENT 7.
9 Jan 74, 36p

Descriptors: (*Waterford-3 reactor, *Environment), Meteorology, Reactor sites.

For abstract, see NSA 29 07, number 17874.

DOCKET-50397-56 PC$3.00/MF$1.45
Washington Public Power Supply System, Richland (Usa).
WPPSS NUCLEAR PROJECT NO. 2. DESIGN CRITERIA FOR INACTIVE PUMPS AND VALVES.
14 Jan 74, 9p

Descriptors: (*Wnp-2 reactor, *Reactor cooling systems), Design, Pumps, Specifications, Valves.

For abstract, see NSA 29 07, number 17875.

DOCKET-50400-61 PC$14.25/MF$1.45
Carolina Power and Light CO., Raleigh, N.C. (Usa).
SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 1, 2, 3, AND 4. AEC REVISED DRAFT ENVIRONMENTAL STATEMENT.
Jan 74, 241p DOCKET-50401-61, DOCKET-50402-61

Descriptors: (*Harris-1 reactor, *Environment), (*Harris-2 reactor, Environment), (*Harris-3 reactor, Environment), (*Harris-4 reactor, Environment), Climates, Construction, Cost benefit analysis, Ecology, Electric power, Geography, Hydrology, Radioactive waste disposal, Reactor operation, Reactor sites, Thermal effluents.

For abstract, see NSA 29 07, number 17876.

DOCKET-50409-85 PC$5.00/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis. (Usa).
LA CROSSE BOILING WATER REACTOR. ANALYSIS OF THE FIRST VESSEL MATERIAL SURVEILLANCE CAPSULE WITHDRAWAL.
29 Nov 73, 58p

Descriptors: (*Lacbwr reactor, *Pressure vessels), Ductility, Inspection, Neutrons, Physical radiation effects, Plates, Temperature dependence, Testing, Welded joints.

For abstract, see NSA 29 07, number 17877.

DOCKET-50409-92 PC$4.50/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis. (Usa).
LACROSSE BOILING WATER REACTOR. TECHNICAL EVALUATION OF THE REACTOR EMERGENCY CORE COOLING SYSTEM.
10 Jan 74, 46p

Descriptors: (*Lacbwr reactor, *Eccs), Core spray systems, Design, Fuel cans, Loss of coolant, Performance, Specifications, Temperature dependence, Transients.

For abstract, see NSA 29 07, number 17878.

DOCKET-50466-3 PC$18.00/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 3.
5 Dec 73, 319p DOCKET-50467-3

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Geology, Ground motion, Reactor sites, Seismology, Soils, Stability, Surfaces.

For abstract, see NSA 29 07, number 17879.

DOCKET-50466-9 PC$21.25/MF$1.45
Houston Lighting and Power CO., Tex. (Usa).
ALLENS CREEK NUCLEAR GENERATING STATION, UNITS 1 AND 2. LICENSE APPLICATION, PSAR, VOLUME 9.
5 Dec 73, 384p DOCKET-50467-9

Descriptors: Allens creek-1 reactor, Allens creek-2 reactor, Auxiliary water systems, Bypasses, Fire hazards, Fluid poison control, Heating, Jets, Radiation monitoring, Radioactive waste disposal, Seals, Steam condensers, Turbogenerators.

For abstract, see NSA 29 07, number 17880.

EIR-242 PC$6.75/MF$1.45
Eidgenoessiches Inst. Fuer Reaktorforschung, Wuerenlingen (Switzerland).
STARTUP OF DIORIT II REACTOR.
H. Flury, W. Jeschki, and L. Nechvatal. Jul 73, 91p
In German. U.S. Sales Only.

Descriptors: (*Diorit reactor, *Reactor start-up), Power, Reactor kinetics, Temperature coefficient.

For abstract, see NSA 29 07, number 17597.

EURFNR-1112 PC$14.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Material- und Festkoerperforschung.
DESIGN, IRRADIATION, AND POSTIRRADIATION EXAMINATION OF THE UO SUB 2 /PUO SUB 2 FUEL PIN IRRADIATION EXPERIMENTS OF FR-2 CAPSULE TEST GROUP 4A.
D. Freund, T. Dippel, D. Geithoff, and P. Weimar. Apr 73, 237p

Descriptors: (*Snr reactor, *Fuel pins), (*Uranium dioxide, *Physical radiation effects), (*Plutonium oxides, Physical radiation effects), (*Stainless steels, Physical radiation effects), Design, Fabrication, Irradiation capsules, Performance testing.

For abstract, see NSA 29 07, number 17574.

ORNL-4926 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ANALYSIS OF CHEMICAL FAILURE OF COATED UO SUB 2 AND OTHER OXIDE FUELS IN THE HIGH-TEMPERATURE GAS-COOLED REACTOR.
T. B. Lindemer, and H. J. de Nordwall. Jan 74, 85p
Contract W-7405-eng-26

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Failures), (*Uranium dioxide, *Chemical radiation effects), (*Thorium oxides, Chemical radiation effects), Oxygen, Performance, Pyrolytic carbon, Thermodynamics.

For abstract, see NSA 29 07, number 17563.

RD/B/N-2773 PC$3.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
CALIBRATION OF ORIFICE PLATES USED IN AGR SINGLE PIN TESTS IN NO. 2 CO SUB 2 RIG AT BERKELEY NUCLEAR LABORATORIES.
M. A. M. Pirie. Oct 73, 19p
U.S. Sales Only.

Descriptors: (*Agr type reactors, Fuel pins), (*Fuel pins, *Gas flow), (*Orifices, *Calibration), Carbon dioxide, Coolant loops, Heat transfer, Plates.

For abstract, see NSA 29 07, number 17564.

RT/ING-(73)6 PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ANALYSIS OF FACTORS INFLUENCING THE SUPERHEAT ON THE BASIS OF THE EXPERIMENTAL DATA.
G. Scarano, P. Iannuzzo, and M. Pezzilli. 1972, 15p CONF-721154-1, RVI-PEC-718
U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, *Reactor accidents), (*Liquid metals, *Boiling), Fbr type reactors, Forced convection, Superheating.

For abstract, see NSA 29 07, number 17578.

SLA-73-876 PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SANDIA PULSED REACTOR III (SPR III): NEUTRON PHYSICS CORE CALCULATIONS.
T. R. Schmidt. Jan 74, 23p
Contract AT(29-1)-789

Descriptors: (*Spr-3 reactor, *Reactor kinetics), Boltzmann equation, Critical size, Discrete ordinate method, Multigroup theory, Neutron transport theory, Reactivity worths, T codes, Two-dimensional calculations.

For abstract, see NSA 29 07, number 17629.

TID-3333-81 PC$10.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
LIQUID METAL FAST BREEDER REACTORS, 1972--1973.
Jan 74, 337p

Descriptors: (*Lmfbr type reactors, *Bibliographies), Fbr type reactors.

For abstract, see NSA 29 07, number 17579.

WAPD-TM-1070 PC$8.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
HOTROD: A COMPUTER PROGRAM FOR SUBCHANNEL ANALYSIS OF COOLANT FLOW IN ROD BUNDLES.
S. G. Beus, J. H. Anderson, and R. J. DeCristofaro. Nov 73, 125p
Contract AT(36-1)-GEN-14

Descriptors: (*Pwr type reactors, *Critical heat flux), (*Computer codes, *H codes), Fortran, Fuel assemblies, Fuel channels, Fuel rods, Heat transfer, Hydraulics, Liquid flow.

For abstract, see NSA 29 07, number 17559.

18F. Radiation Shielding and Protection

COM-74-50123/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MOMENTS METHOD CALCULATIONS OF NEUTRON DISTRIBUTIONS IN CONCRETE.
Final rept.,
G. L. Simmons, and C. Eisenhauer. 1974, 23p
Pub. in Nuclear Science and Engineering, v53 p197-219 1974.

Descriptors: *Neutron flux, *Concrete, *Radiation shielding.
Identifiers: Method of moments.

The moments method is applied to the problem of calculating neutron distributions in an infinite medium. Several comparisons are given of these results with similar data calculated by the discrete ordinates method. New calculations are presented on the distribution of doses from neutrons, originating in a plane-slant fission source and incident, at various angles, on concrete utilized in radiation measurements at the Tower Shielding Facility of the Oak Ridge National Laboratory (TSF concrete). For a given set of neutron cross sections, these results give reliable estimates of the dose distribution at deep penetrations; i.e., attenuation of six orders of magnitude or more. Functional representations of the distributions are included in order to facilitate the use of the data in shield design calculations.

LCA-NT-228-E-T PC$3.00/MF$1.45
Laboratoire Central de l'Armement, 94 - Arcueil (France). Dept. Detection Protection Nucleaire.
RADIOPROTECTION OF A CYLINDRICAL CONTAINER.
B. Warme-Janville. 12 Dec 72, 16p
In French. U.S. Sales Only.

Descriptors: (*Casks, *Biological shielding), Cylindrical configuration, Depleted uranium, Lead, Radiation protection.

For abstract, see NSA 29 07, number 16428.

PEM-3 PC$3.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SHIELDING EFFECTIVENESS OF THE LIQUID TIGHT FLEXIBLE CONDUIT FROM TRANSIENT TESTS.
E. F. Vance. 1971, 23p

Descriptors: (*Electric cables, *Physical radiation effects), (*Electromagnetic pulses, *Shielding), (*Nuclear explosions, Electromagnetic pulses), Atmospheric explosions.

For abstract, see NSA 29 07, number 15534.

SLA-73-0014 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TEMPERATURE MEASUREMENT IN A HIGH-TEMPERATURE CARBON MULTILAYER REENTRY VEHICLE HEATSHIELD.
G. R. Jr. Wright, S. G. Jr. Beard, and D. F. McVey. 7p CONF-731106-3

Descriptors: (*Space vehicles, *Temperature measurement), (*Thermal shields, Temperature measurement), Carbon, Reentry, Thermodynamics.

For abstract, see NSA 29 07, number 18026.

18G. Radioactive Wastes and Fission Products

BNL-18351 PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
RADIOACTIVE SAFETY ASPECTS OF WASTE MANAGEMENT.
A. P. Hull. 1973, 21p CONF-731127-2

Descriptors: (*Radioactive waste disposal, *Safety), Radiation protection, Reviews.

For abstract, see NSA 29 07, number 16407.

CONF-731120-1 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
RADIOACTIVE WASTE SYSTEMS AND RADIOACTIVE EFFLUENTS.
T. H. Row. 1973, 14p

Descriptors: (*Lwbr type reactors, *Radioactive waste disposal), (*Pwr type reactors, Radioactive waste disposal), Gaseous wastes, Liquid wastes, Solid wastes.

For abstract, see NSA 29 07, number 16408.

DPSPU-59-11-16 PC$3.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Plant.
RADIOACTIVITY IN R-AREA SEEPAGE BASIN SYSTEM.
J. H. Horton, and H. G. Mealing. Jul 59, 9p

Descriptors: (*Radioactive waste disposal, *Underground disposal), (*Radioactive wastes, *Radiation monitoring), Liquid wastes, Savannah river plant.

For abstract, see NSA 29 07, number 16409.

GEAP-12428 PC$4.50/MF$1.45
General Electric CO., Pleasanton, Calif. (Usa). Vallecitos Nuclear Center.
FISSION GAS RE-SOLUTION RATES. FINAL REPORT JUNE 30, 1973.
M. O. Marlowe. Jun 73, 47p
Contract AT(04-3)-189

Descriptors: (*Uranium dioxide, Fission products), (*Fission products, *Bubbles), Annealing, Dissolution, Gases, Irradiation, Physical radiation effects, Size, Solubility.

For abstract, see NSA 29 07, number 16122.

IDO-10052 PC$9.75/MF$1.45
Usaec Idaho Operations Office, Idaho Falls.
NRTS RADIOACTIVE WASTE MANAGEMENT INFORMATION FOR 1971.
1973, 155p

Descriptors: (*Radioactive waste disposal, Nrts), (*Nrts, *Waste management), Computer codes, Computers, Data, Waste storage.

For abstract, see NSA 29 07, number 16410.

IDO-10053 PC$9.75/MF$1.45
Usaec Idaho Operations Office, Idaho Falls.
NRTS RADIOACTIVE WASTE MANAGEMENT INFORMATION FOR 1972.
1973, 154p

Descriptors: (*Radioactive waste disposal, Nrts), (*Nrts, *Waste management), Computer codes, Computers, Data, Waste storage.

For abstract, see NSA 29 07, number 16411.

ORNL-TM-4449 PC$6.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
STORAGE AND RELEASE OF RADIATION ENERGY IN SALT IN RADIOACTIVE-WASTE REPOSITORIES.
G. H. Jenks, and C. D. Bopp. Jan 74, 82p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste disposal, *Salt deposits), (*Sodium chlorides, *Stored energy), Gamma radiation, Irradiation.

For abstract, see NSA 29 07, number 16414.

RT/PROT-(73)24 PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
MAXIMUM VERTICAL DISPLACEMENT OF SEA LEVEL OF THE TARANTO REGION DURING THE LAST 125,000 YEARS AND THE OUTLOOK FOR THE GEOLOGIC DESTINATION OF WASTES CONTAINING TRANSURANIC ELEMENTS.
G. Dai Pra, and G. Magri. 1973, 5p
In Italian. U.S. Sales Only.

Descriptors: (*Seas, *Levels), (*Radioactive waste disposal, *Underground disposal), Contamination, Environment, Geologic deposits, Geology, Isotope dating, Italy, Plutonium 239, Radioactive wastes, Safety.

For abstract, see NSA 29 07, number 16417.

18H. Radioactivity

DOCKET-701193-6 PC$17.00/MF$1.45
Kerr-Mcgee Corp., Oklahoma City, Okla. (Usa).
CIMARRON PLUTONIUM PRODUCTION PLANT. ENVIRONMENTAL REPORT, SUPPLEMENT 1.
Dec 73, 296p

Descriptors: (*Fuel fabrication plants, *Environment), Nuclear materials management, Radiation accidents, Radiation monitoring, Radioactive waste disposal, Radioactive wastes, Seismic effects, Seismology, Thermal effluents.

For abstract, see NSA 29 07, number 15657.

LA-UR-73-1428 PC$3.25/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PRINCIPLES OF SAFETY. SAFETY IN GENERAL, CRITICALITY RISK IN PERSPECTIVE.
R. Reider. 21p CONF-731056-1

Descriptors: (*Safety, *Education), (*Radiation accidents, *Radiation protection), Accidents, Criticality, Injuries, Management, Personnel, Safety engineering.

For abstract, see NSA 29 07, number 17944.

ORNL-TM-4451 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
TECALC: A PROGRAM TO CALCULATE COMPTON, COHERENT, AND PHOTOELECTRIC MASS ATTENUATION COEFFICIENTS FOR PHOTONS WITH ENERGIES LESS THAN 1 MEV AND TO ASSIST IN THE EVALUATION AND FORMULATION OF PHOTON-EQUIVALENT MATERIALS.
P. S. Stansbury. Jan 74, 36p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *T codes), (*Gamma transport theory, Computer codes), (*Gamma radiation, *Attenuation), Coherent scattering, Compton effect, Photoelectric effect, Photon transport.

For abstract, see NSA 29 07, number 17457.

PEM-17 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
CONNECTOR DESIGN AND TEST PRACTICES.
D. F. Cook. 15p

Descriptors: (*Connectors, *Physical radiation effects), (*Missiles, Connectors), (*Nuclear explosions, *Electromagnetic pulses), Atmospheric explosions.

For abstract, see NSA 29 07, number 15780.

PNE-RB-51-1 PC$3.50/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa). Dept. Of Nuclear Sciences.
RADIOLOGICAL MONITORING PROGRAM, PERIOD COVERING OCTOBER 1, 1971 THRU DECEMBER 31, 1971 FOR CER GEONUCLEAR CORPORATION, PROJECT RIO BLANCO.
26p

Descriptors: (*Rio blanco event, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Alpha sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), Cerium 144, Colorado, Environment, Fallout, Milk, Natural radioactivity, Plants, Radioactivity, Ruthenium 106, Sampling, Strontium 89, Strontium 90, Surface air, Surface waters, Tritium, Zirconium 95.

For abstract, see NSA 29 07, number 15658.

PNE-RB-51-2 PC$3.00/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa). Dept. Of Nuclear Sciences.
RADIOLOGICAL MONITORING PROGRAM: PERIOD COVERING JANUARY 1, 1972 THRU MARCH 31, 1972.
1972, 17p

Descriptors: (*Rio blanco event, *Radiation monitoring), (*Cerium 141, Radiation monitoring), (*Ruthenium 103, Radiation monitoring), (*Tellurium 132, Radiation monitoring), Beta sources, China, Colorado, Environment, Fallout, Gamma sources, Natural radioactivity, Nuclear explosions, Radioactivity, Soils, Surface air, Tritium.

For abstract, see NSA 29 07, number 15659.

PNE-RB-51-3 PC$3.25/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa). Dept. Of Nuclear Sciences.
RADIOLOGICAL MONITORING PROGRAM: PERIOD COVERING APRIL 1, 1972 THRU JUNE 30, 1972.
1972, 22p

Descriptors: (*Rio blanco event, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Tritium, Radiation monitoring), Colorado, Environment, Fallout, Milk, Natural radioactivity, Plants, Potassium 40, Radioactivity, Soils, Strontium 90, Surface air, Surface waters.

For abstract, see NSA 29 07, number 15660.

PNE-RB-51-4 PC$3.00/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa). Dept. Of Nuclear Sciences.
RADIOLOGICAL MONITORING PROGRAM, JULY 1, 1972--SEPTEMBER 30, 1972.
1972, 18p

Descriptors: (*Rio blanco event, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Strontium 90, Radiation monitoring), Cerium 144, Colorado, Environment, Fallout, Fishes, Milk, Natural radioactivity, Potassium 40, Radioactivity, Ruthenium 106, Sampling, Surface air, Surface waters, Zirconium 95.

For abstract, see NSA 29 07, number 15661.

PNE-RB-51-5 PC$3.25/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa).
RADIOLOGICAL MONITORING PROGRAM, FEBRUARY 15, 1973--MAY 16, 1973.
1973, 23p

Descriptors: (*Rio blanco event, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Tritium, Radiation monitoring), Beryllium 7, Cesium 137, Colorado, Earth atmosphere, Environment, Fallout deposits, Milk, Natural radioactivity, Plants, Potassium 40, Soils, Strontium 90, Surface waters.

For abstract, see NSA 29 07, number 15662.

PNE-WW-32 PC$3.25/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa).
ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING MAY 1, 1973 THRU JULY 31, 1973.
1973, 25p

Descriptors: (*Wagon wheel event, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Gamma sources, Radiation monitoring), (*Strontium 90, Radiation monitoring), Cesium 137, Drinking water, Environment, Fallout deposits, Milk, Natural radioactivity, Plants, Potassium 40, Soils, Surface waters, Tritium, Wyoming.

For abstract, see NSA 29 07, number 15663.

UCRL-50007-73-2 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HAZARDS CONTROL PROGRESS REPORT NO. 46, JANUARY--APRIL 1973.
25 Sep 73, 25p
Contract W-7405-eng-48

Descriptors: (*Hazards, *Research programs), (*Radiation protection, Research programs), (*Measuring instruments, Research programs), Activation detectors, Asbestos, Chest, Computer codes, Criticality, Design, Dusts, Fourier transformation, Laboratory equipment, Liquid wastes, Lithium fluorides, Monte carlo method, Neutron spectroscopy, Radioactive wastes, Respirators, Thermoluminescence, Thermoluminescent dosemeters, Thickness, Thickness gages, Uranium hydrides, Uranium 233, Ventilation.

For abstract, see NSA 29 07, number 15540.

18I. Reactor Engineering and Operation

AEC-tr-7502 PC$3.75/MF$1.45
Atomic Energy Commission, Tokyo (Japan).
EXAMINATION GUIDELINES FOR THE SAFETY DESIGN OF LIGHT WATER REACTORS.
34p

Translation of Japanese report.

Descriptors: (*Pwr type reactors, *Reactor safety), (*Bwr type reactors, Reactor safety), (*Japan, *Reactor licensing), Design.

For abstract, see NSA 29 07, number 17669.

ANL/ES-25 PC$7.60/MF$1.45
Argonne National Lab., Ill. (Usa).
TEMPERATURE AND VELOCITY MEASUREMENTS AND PREDICTIVE MODEL COMPARISONS IN THE NEAR-FIELD REGION OF SURFACE THERMAL DISCHARGES.
R. A. Paddock, A. J. Policastro, A. A. Frigo, D. E. Frye, and J. V. Tokar. Oct 73, 170p
Contract W-31-109-Eng-38

Descriptors: (*Point beach-1 reactor, *Thermal effluents), (*Palisades-1 reactor, Thermal effluents), Comparative evaluations, Environment, Liquid flow, Mathematical models, Surface waters, Temperature monitoring.

For abstract, see NSA 29 07, number 17670.

FIND-58354 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: HOPE CREEK GENERATING STATION, UNITS 1 AND 2.
F. H. Horn. Jan 74, 21p

Descriptors: (*Hope creek-1 reactor, *Reactor safety), (*Hope creek-2 reactor, Reactor safety), Indexes.

For abstract, see NSA 29 07, number 17673.

HW-57018 PC$3.50/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
REACTOR SAFETY CIRCUITS. 105-N DESIGN CRITERIA. PROJECT CAI-816.
G. H. Strong. 15 Sep 59, 26p

Descriptors: (*Hanford production reactors, *Reactor control systems), Design, Scram.

For abstract, see NSA 29 07, number 17734.

IRS-A-5 PC$5.50/MF$1.45
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine E.V., Koeln (F.R. Germany).
EMERGENCY COOLING OF NUCLEAR REACTORS. HEAT TRANSFER INVESTIGATIONS.
D. Andreoni. Jul 73, 68p
In German. U.S. Sales Only.

Descriptors: (*Pwr type reactors, *Ecca), (*Reactor accidents, *Heat transfer), Mockup, Simulation.

For abstract, see NSA 29 07, number 17681.

NP-19909 PC$6.00/MF$1.45
Organization for Economic CO-Operation and Development, 75 - Paris (France).
OECD NUCLEAR ENERGY AGENCY FIRST ACTIVITY REPORT.
1972, 79p
U.S. Sales Only.

Descriptors: (*Nuclear energy, *Information), (*Radiation protection, *Research programs), (*Waste management, Research programs), (*Direct energy conversion, Research programs), Computers, Dragon reactor, Economics, Environment, Fast reactors, Gas cooled reactors, Hbwr reactor, Legal aspects, Oecd, Radioisotope generators, Regulations.

For abstract, see NSA 29 07, number 17945.

RT/PROT-(73)15 PC$5.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
DESCRIPTION OF THE PROGRAM OF THE FRUSTA CODE.
D. Dini, and L. Lazzeri. 18 Apr 73, 67p
In Italian. U.S. Sales Only.

Descriptors: (*Power reactors, *Loss of coolant), (*Pipelines, *Stresses), (*Supports, Stresses), (*F codes, *Computer codes), Reactor safety.

For abstract, see NSA 29 07, number 17683.

TID-3339-P3-1 PC$13.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
GAS-COOLED REACTOR TECHNOLOGY. A BIBLIOGRAPHY (PART 3).
J. W. Norris. Jan 74, 716p

Descriptors: (*Gas cooled reactors, *Bibliographies).

For abstract, see NSA 29 07, number 17549.

TID-3339-P3-2 PC$10.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
GAS-COOLED REACTOR TECHNOLOGY. A BIBLIOGRAPHY (PART 3).
J. W. Norris. Jan 74, 330p

Descriptors: (*Gas cooled reactors, *Bibliographies), Indexes.

For abstract, see NSA 29 07, number 17550.

UCID-16407 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SEISMIC EFFECTS ON A PROPOSED UNDERGROUND REACTOR FACILITY.
F. J. Tokarz, and R. C. Murray. 26 Feb 73, 12p
Contract W-7405-eng-48

Descriptors: (*Containment buildings, *Seismic effects), (*Reactor sites, *Underground), Finite element method, Geology, Nuclear power plants, Stress analysis.

For abstract, see NSA 29 07, number 17684.

WANL-TNR-209 PC$23.75/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Astronuclear Lab.
SAFETY ANALYSIS REPORT: EVALUATION OF PASSIVE RE-ENTRY APPROACH.
J. M. Bridges, W. S. Brown, D. W. Call, J. D. Cleary, and H. G. Hargrove. Sep 65, 435p
Contract SNP-1

Descriptors: (*Nerva reactor, *Reactor accidents), Failures, Radiation hazards, Reactor safety, Reentry.

For abstract, see NSA 29 07, number 17685.

18J. Reactor Materials

AAEC/E-231 PC$3.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
THERMAL SHOCK TESTING OF CERAMIC BALLS REPRESENTING PEBBLE BED REACTOR FUEL ELEMENTS.
J. F. Whatham. Aug 73, 15p
U.S. Sales Only.

Descriptors: (*Pebble bed reactors, Fuel elements), (*Fuel elements, *Thermal shock), (*Beryllium oxides, Thermal shock), Carbon dioxide, Cracks, Heat transfer, High temperature, Power density, Quenching, Simulation, Solid fuels, Spherical configuration, Thermal stresses, Thermal testing.

For abstract, see NSA 29 07, number 16119.

AWRE-O-58-73 PC$4.00/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
MEASUREMENT OF THE CRITICAL SIZE OF SOLUTIONS OF PLUTONIUM AND NATURAL URANIUM NITRATES WITH PU/U = 0.3.
R. C. Lane, and C. Parker. Dec 73, 40p
U.S. Sales Only.

Descriptors: (*Criticality, *Plutonium nitrates), (*Uranium nitrates, Criticality), Mixtures, Natural uranium, Solutions.

For abstract, see NSA 29 07, number 16422.

COS-14 PC$3.00/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment; International Atomic Energy Agency, Vienna (Austria).
APPLICATION OF SAFEGUARDS TECHNIQUES TO A LARGE ZERO-ENERGY FAST REACTOR FACILITY.
F. Brown, D. R. Terrey, P. T. Good, A. E. Ross, and A. Lumetti. 16p CONF-700701-8, SM-133-69
U.S. Sales Only.

Descriptors: (*Zebra reactor, Safeguards), (*Safeguards, Plutonium 239), (*Uranium 235, *Nondestructive analysis), (*Plutonium 239, Nondestructive analysis), Fuel pins, Fuel plates, Nuclear materials management.

For abstract, see NSA 29 07, number 16396.

COS-15 PC$3.50/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
APPLICATION OF INSTRUMENTAL METHODS TO THE DETERMINATION OF NUCLEAR FUEL MATERIALS FOR SAFEGUARDS.
F. Brown, D. R. Terrey, J. B. Hornsby, R. G. Monk, and F. Morgan. 26p CONF-700701-9, SM-133-70
U.S. Sales Only.

Descriptors: (*Fissile materials, *Safeguards), Absorption spectroscopy, Fission, Fission neutrons, Gamma spectroscopy, Neutron reactions, Nuclear fuels, Nuclear reaction analysis, Radiometric analysis, Voltametry.

For abstract, see NSA 29 07, number 16397.

COS-16 PC$3.00/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
CRITERIA FOR THE DESIGN OF NUCLEAR INSTALLATIONS TO FACILITATE THE APPLICATION OF SAFEGUARDS.
F. Brown, R. F. Coles, J. E. Ellingsen, J. A. Golder, and C. Goodwin. 6p CONF-700701-10, SM-133-71
U.S. Sales Only.

Descriptors: (*Fissile materials, *Safeguards), Industrial plants, Nuclear materials management, Planning.

For abstract, see NSA 29 07, number 16398.

COS-4 PC$3.25/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
SAMPLING OF STORES FOR SAFEGUARDS PURPOSES.
F. Brown, P. T. Good, and J. B. Parker. 23p
U.S. Sales Only.

Descriptors: (*Fissile materials, Safeguards), (*Safeguards, *Inspection), Accounting, Nuclear materials management, Plutonium, Sampling, Uranium 235.

For abstract, see NSA 29 07, number 16394.

COS-4-A PC$3.25/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
SAMPLING OF STORES FOR SAFEGUARDS PURPOSES.
F. Brown, P. T. Good, and J. B. Parker. Jun 70, 23p
U.S. Sales Only.

Descriptors: (*Fissile materials, Safeguards), (*Safeguards, *Inspection), Accounting, Nuclear materials management, Plutonium, Sampling, Uranium 235.

For abstract, see NSA 29 07, number 16395.

DOCKET-50201-147 PC$41.00/MF$1.45
Nuclear Fuel Services, Inc., Rockville, MD. (Usa).
WEST VALLEY REPROCESSING PLANT. SAFETY ANALYSIS REPORT, VOLUME 1.
1973, 776p

Descriptors: (*West valley processing plant, *Safety engineering), Containment systems, Site selection.

For abstract, see NSA 29 07, number 15432.

GEAP-12114-8 PC$4.00/MF$1.45
General Electric CO., San Jose, Calif. (Usa). Nuclear Fuels Dept.
JOINT PLANT INSTRUMENTATION PROGRAM AND INTEGRATED SAFEGUARDS EXPERIMENT. FINAL REPORT.
D. C. Wadekamper, D. M. Bishop, and L. T. Hagie. Jun 72, 26p BHO-68-8
Contract AT(30-1)-68

Descriptors: (*Safeguards, Plutonium oxides), (*Uranium oxides, *Nondestructive analysis), (*Plutonium oxides, Nondestructive analysis), Bf3 counters, Calorimeters, Gamma spectrometers, Gamma spectroscopy, Material unaccounted for, Neutron detection, Radiometric analysis.

For abstract, see NSA 29 07, number 16399.

GEMP-1011 PC$10.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Missile and Space Div.
AEC FUELS AND MATERIALS DEVELOPMENT PROGRAM. EIGHTH ANNUAL REPORT.
28 Feb 69, 160p
Contract AT(40-1)-2847

Descriptors: (*Fuel elements, *Research programs), (*Uranium dioxide, *Chemical properties), (*Heat resisting alloys, *Compatibility), (*Uranium nitrides, *Fuel particles), Capsules, Compression, Creep, Diffusion, Electric conductivity, Enthalpy, Frenkel defects, Fusion heat, Isothermal processes, Phase diagrams, Physical properties, Sodium oxides, Stainless steels, Tantalum alloy-t111, Thermodynamic properties, Thorium oxides, Viscosity, Cermets, Chemical preparation, Density, Gases, Metals, Molybdenum compounds, Nuclear fuels, Physical radiation effects, Pressure measurement, Refractories, Stoichiometry, Tables, Testing, Thermal cycling, Thermal stability, Time dependence, Tungsten compounds, Very high temperature, Burnup, Containment, Fabrication, Fission products, Fuel cans, Fuel rods, Tungsten, Distribution, Impurities, Leaks, Mechanical properties, Transport.

For abstract, see NSA 29 07, number 16127.

GEMP-174 PC$3.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
EVALUATION OF BEO FUEL ELEMENT CONTAINING A STABILIZED FUEL ADDITIVE.
G. T. Muehlenkamp. 28 May 63, 18p
Contract AT(40-1)-2847

Descriptors: (*Beryllium oxides, Hollow fuel rods), (*Uranium dioxide, Hollow fuel rods), (*Yttrium oxides, Hollow fuel rods), (*Hollow fuel rods, *Mechanical properties), Compression strength, Deformation, Dimensions, Heat treatments, Medium pressure, Microstructure, Ruptures, Stability, Tensile properties, Time dependence, Very high temperature, Yield strength.

For abstract, see NSA 29 07, number 16123.

GEMP-345-B PC$3.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
HIGHLIGHTS OF GE-NMPO RESEARCH (CY 1964). PART B.
1 Mar 65, 7p

Descriptors: (*Fuel elements, *Htgr type reactors), (*Control elements, Htgr type reactors), (*Neutron reflectors, Htgr type reactors), (*Shielding, Htgr type reactors), Beryllium oxides, Burnup, Chemical properties, Coated fuel particles, Compatibility, Dispersions, Fuel cans, Hafnium carbides, Heat resisting alloys, Nuclear fuels, Physical properties, Reactor materials, Research programs, Reviews, Solid solutions, Stability, Stoichiometry, Tantalum carbides, Tantalum compounds, Thermodynamic properties, Thorium oxides, Time dependence, Tungsten compounds, Uranium dioxide, Very high temperature.

For abstract, see NSA 29 07, number 16124.

GEMP-400-B PC$10.50/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
HIGH-TEMPERATURE MATERIALS COMPONENT PROGRAMS, PART B. FIFTH ANNUAL REPORT.
28 Feb 66, 166p
Contract AT(40-1)-2847

Descriptors: (*Uranium dioxide, *Mechanical properties), (*Thorium oxides, Mechanical properties), (*Tungsten compounds, Mechanical properties), Beryllium oxides, Burnup, Diffusion, Fission products, Fuel rods, Microstructure, Physical radiation effects, Ruptures, Stability, Very high temperature, Yttrium oxides, Zirconium oxides, Cermets, Creep, Electrical properties, Fuel cans, Heat resisting alloys, Physical properties, Tensile properties, Thermodynamic properties, Chemical properties, Corrosive effects, Hydrogen, Lattice parameters, Methane, Mixtures, Nuclear fuels, Reactor materials, Strains, Tantalum carbides, Uranium carbides, Vapor pressure, Very high pressure, Aluminium oxides, Corrosion, Gas fueled reactors, Halogens, Nuclear properties, Silicon oxides, Uranium chlorides, Control elements, Deuterium compounds, Enthalpy, Hydride moderators, Oxides, Rare earth compounds, Shielding materials, Thorium hydrides, Titanium hydrides, Uranium hydrides, Yttrium hydrides, Zirconium hydrides, Capsules, Chemical reactions, Grain boundaries, Isothermal processes, Melting points, Molybdenum, Oxidation, Oxygen, Reaction kinetics, Solid solutions, Solubility, Stoichiometry, Tantalum, Thermal cycling, Uranium, Vaporization heat.

For abstract, see NSA 29 07, number 16125.

GEMP-600(Vol.6) PC$15.25/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
710 HIGH-TEMPERATURE GAS REACTOR PROGRAM SUMMARY REPORT. VOLUME VI. FUEL ELEMENT DRAWINGS AND MANUFACTURING SPECIFICATIONS.
1967, 262p
Contract AT(40-1)-2847

Descriptors: (*Gas cooled reactors, Fuel elements), (*Fuel elements, *Specifications), (*Tungsten alloys, *Fuel cans), (*Rhenium alloys, Fuel cans), Aircraft propulsion reactors, Cermets, Fabrication, Flowsheets, Molybdenum alloys, Tantalum alloy-t111.

For abstract, see NSA 29 07, number 16126.

GERHTR-45 PC$3.50/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
STRUCTURE OF PROPENE-PYROCARBON COATING LAYERS ON COATED NUCLEAR FUEL PARTICLES AND THEIR MODIFICATION BY ANNEALING.
E. Gyarmati, K. Koizlik, and A. K. Gupta. Sep 71, 30p JUL-795-RW

Descriptors: (*Pyrolytic carbon, *Grain orientation), (*Thorium oxides, *Coated fuel particles), (*Uranium dioxide, Coated fuel particles), Annealing, Br-2 reactor, Coatings, Fast neutrons, Layers, Neutron beams, Physical radiation effects, Pile neutrons, Propylene.

For abstract, see NSA 29 07, number 16128.

GERHTR-47 PC$4.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
INVESTIGATIONS TO DECREASE THE RELEASE OF SOLID FISSION PRODUCTS FROM COATED FUEL PARTICLES BY THE ADDITION OF REFRACTORY OXIDES TO THE FUEL KERNEL.
R. Foerthmann, M. Hamesch, and H. Nickel. May 72, 42p JUL-846-RW

Descriptors: (*Uranium dioxide, *Coated fuel particles), (*Thorium oxides, Coated fuel particles), (*Fission products, *Containment), Aluminium oxides, Barium, Burnup, Cerium, Control, Leaks, Strontium, Very high temperature.

For abstract, see NSA 29 07, number 16129.

GERHTR-59 PC$3.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Chemische Technologie.
DEVELOPMENT OF A METHOD AND EXPERIMENTAL INSTALLATION FOR PREFABRICATING HTGR FUELS.
E. Zimmer, P. Naefe, and H. Ringel. 1973, 6p

Descriptors: (*Htgr type reactors, Fuel particles), (*Fuel particles, *Precipitation), Ammonia, Aqueous solutions, Ketones.

For abstract, see NSA 29 07, number 15433.

GERHTR-69 PC$3.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
CHANGE IN ORIENTATION ANISOTROPY AND MICROPOROSITY IN PYROLYTIC CARBON.
K. Koizlik, P. Krautwasser, and H. Nickel. Mar 73, 7p

Descriptors: (*Coated fuel particles, Pyrolytic carbon), (*Pyrolytic carbon, *Annealing), Anisotropy, Density, Diffusion, Orientation, Porosity, Vacancies, Very high temperature.

For abstract, see NSA 29 07, number 16366.

GERHTR-70 PC$3.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
MODEL INVESTIGATIONS OF CONICAL FLUIDIZED BEDS FOR THE COATING OF NUCLEAR FUEL PARTICLES.
C. F. Wallroth, E. Gyarmati, and H. Nickel. 1971, 23p

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Coatings), Bubbles, Deposition, Fluidized bed, Mockup, Nozzles, Simulation.

For abstract, see NSA 29 07, number 16130.

GERHTR-79 PC$4.50/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
STUDIES ON THE PRODUCTION OF SPHERICAL FUEL PARTICLES BY A SOL-GEL PROCESS.
R. Foerthmann, A. Naoumidis, and H. Nickel.
Mar 69, 50p

Descriptors: (*Fuel particles, *Production), (*Uranium carbides, Production), (*Uranium nitrides, Production), (*Htgr type reactors, Fuel particles), Carbonitrides, Sol-gel process, Thorium oxides, Uranium dioxide.

For abstract, see NSA 29 07, number 16131.

HW-57015 PC$5.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
PRIMARY COOLANT SYSTEM. 105-N DESIGN CRITERIA. PROJECT CAI-816.
L. G. Henke. 13 Nov 59, 58p

Descriptors: (*N-reactor, *Primary coolant circuits), Configurstion, Design, Pipelines, Valves.

For abstract, see NSA 29 07, number 17651.

HW-57044 PC$3.50/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
100-N DESIGN BASES. PART II. FUNCTIONAL REQUIREMENTS OF THE PRIMARY LOOP CONTROL AND INSTRUMENTATION SYSTEMS. PROJECT CAI-816.
D. L. Condotta. 11 Sep 59, 29p

Descriptors: (*Hanford production reactors, *Primary coolant circuits), Control systems, Design, Reactor instrumentation.

For abstract, see NSA 29 07, number 17652.

HW-71278 PC$9.50/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
QUALITY CONTROL STANDARDS. COEXTRUSION PROCESS.
9 Oct 61, 150p

Descriptors: (*Fuel elements, Extrusion), (*Extrusion, *Standards), Copper, Fuel cans, Machining, Quality control, Spacers, Uranium, Zircaloy.

For abstract, see NSA 29 07, number 16215.

IAE-2227 PC$4.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
THERMAL CONDUCTIVITY OF URANIUM DIOXIDE.
V. I. Kolyadin, E. P. Il'in, A. G. Kharlamov, and V. V. Yakovlev. 1972, 36p
In Russian. U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Thermal conductivity), High temperature, Medium temperature, Polycrystals, Reviews, Stoichiometry, Temperature dependence, Very high temperature.

For abstract, see NSA 29 07, number 16132.

JEN-276 PC$3.75/MF$1.45
Junta de Energia Nuclear, Madrid (Spain).
STATIC LEACHING OF URANIFEROUS SHALES WITH COUNTERCURRENT CIRCUITS.
G. Cordero, M. Villarrubia, and J. Hernandez. 1973, 32p
In Spanish. U.S. Sales Only.

Descriptors: (*Uranium, *Leaching), (*Uranium ores, *Ore enrichment), Economics, Ph value, Shales, Solvent extraction, Sulfuric acid, Temperature dependence.

For abstract, see NSA 29 07, number 15365.

JUL-943-CT PC$6.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Chemische Technologie.
STUDY ON THE PROCESSING AND FURTHER TREATMENT OF SPENT FUEL ELEMENTS FROM THORIUM HIGH TEMPERATURE REACTORS WITH SPHERIC FUEL ELEMENTS.
H. Jauer, M. Laser, E. Merz, S. Storch, and U. Tillessen. Apr 73, 79p
In German. U.S. Sales Only.

Descriptors: (*Spent fuel elements, *Reprocessing), (*Pebble bed reactors, Spent fuel elements), (*Htgr type reactors, Spent fuel elements), (*Thtr-300 reactor, Spent fuel elements), Fission products, Fuel reprocessing plants, Radioactive waste disposal, Solidification, Spent fuel storage, Spheres, Underground disposal.

For abstract, see NSA 29 07, number 15434.

LA-UR-73-1657 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
EXP 235 U ENRICHMENT DETERMINATION USING EXP 4 HE PROPORTIONAL COUNTERS.
J. T. Caldwell, J. L. Evans, P. E. Fehlau, and T. H. Whittlesey. 1973, 18p CONF-731101-43
Contract W-7405-eng-36

Descriptors: (*Uranium 235, *Nuclear reaction analysis), (*Uranium hexafluoride, *Nondestructive analysis), (*Proportional counters, *Performance), Efficiency, Helium 4, Operation, Radiometric analysis, Thermal fission.

For abstract, see NSA 29 07, number 16400.

NLCO-1044 PC$3.25/MF$1.45
National Lead CO. Of Ohio, Cincinnati (Usa).
RECOVERY OF URANIUM FROM PIQUA COLD SCRAP FUEL ELEMENTS.
G. P. Miller. Jun 69, 24p
Contract AT(30-1)-1156

Descriptors: (*Spent fuel elements, *Mechanical decladding), (*Pnpf reactor, Spent fuel elements), Economics, Material balance, Reprocessing, Uranium.

For abstract, see NSA 29 07, number 15435.

RT/CHI-(73)6 PC$3.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
EFFECTS OF PROCESS DESIGN ON THE OUTLOOK FOR INDUSTRIAL PLANTS FOR NUCLEAR FUEL REPROCESSING.
A. Moccia. 1972, 33p
In Italian. U.S. Sales Only.

Descriptors: Fuel reprocessing plants, Industrial plants, Radioactive waste disposal, Radioactive waste processing, Spent fuels.

For abstract, see NSA 29 07, number 15436.

RT/ING-(73)2 PC$30.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
NUCLEAR REACTOR FUEL CYCLES: FUNDAMENTAL ASPECTS; TECHNOLOGY AND PROCESSING; TECHNICO-ECONOMIC EVALUATION.
L. Bruzzi, and G. Cicognani. 1973, 571p
In Italian. U.S. Sales Only.

Descriptors: (*Power reactors, Fuel cycle), (*Thermal reactors, Fuel cycle), (*Fast reactors, Fuel cycle), (*Fuel cycle, *Economics), Fabrication, Fuel management, Isotope separation, Nuclear fuels, Performance, Reprocessing.

For abstract, see NSA 29 07, number 17742.

RT/PROT-(73)14 PC$6.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
METEOROLOGICAL ANNUAL REPORT, 1972.
3 May 73, 83p
In Italian. U.S. Sales Only.

Descriptors: (*Fuel reprocessing plants, *Meteorology), Climates, Environment, Italy.

For abstract, see NSA 29 07, number 15665.

18K. Reactor Physics

FEI-387 PC$3.25/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
CALCULATION OF MULTIDIMENSIONAL HYDROGENOUS REACTORS IN A MULTIGROUP P SUB 1 APPROXIMATION.
Zh. N. Bel'skaya, Yu. N. Mironovich, and Sh. S. Nikolaishvili. 1973, 25p
In Russian. U.S. Sales Only.

Descriptors: (*Water moderated reactors, *Neutron transport), Algorithms, D codes, Multigroup theory, Neutron diffusion equation, P1-approximation.

For abstract, see NSA 29 07, number 17697.

FEI-392 PC$3.25/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
CALCULATION OF THE EFFECTS OF SELF-SHIELDING DURING MEASUREMENT OF REACTIVITY COEFFICIENTS.
V. A. Dulin, and V. F. Mamontov. 1973, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Uranium, *Reactivity worths), (*Plutonium, Reactivity worths), (*Gold, Reactivity worths), (*Tantalum, Reactivity worths), Boron, Fast reactors, Graphite, Hydrogen, Self-shielding, Zero power reactors.

For abstract, see NSA 29 07, number 17698.

IAE-2250 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
NEW METHOD FOR THE CALCULATION OF HETEROGENEOUS REACTORS.
S. S. Gorodkov. 1973, 16p
U.S. Sales Only.

Descriptors: (*Reactor kinetics, *Neutron diffusion equation), Finite difference method, Mathematical models, Two-dimensional calculations.

For abstract, see NSA 29 07, number 17699.

IAE-2295 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.

TWO-GROUP CALCULATION OF THE HETEROGENEOUS REACTOR BY THE QUASI-ALBEDO METHOD.
S. S. Gorodkov. 1973, 15p
U.S. Sales Only.

Descriptors: (*Reactor kinetics, *Finite difference method), Multigroup theory, Two-dimensional calculations.

For abstract, see NSA 29 07, number 17700.

N74-17424/4GA PC$9.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXTENSION OF CASE'S METHOD TO THE TWO-REGION CRITICAL CYLINDER AND ITS APPLICATION AS AN ANALYTIC STANDARD.
Ph.D. Thesis - Virginia Univ.
R. M. Westfall. May 74, 130p NASA-TM-X-71522

Descriptors: *Critical mass, *Cylindrical bodies, *Reactor cores, Boltzmann transport equation, Integral equations, Neutron flux density, Reactor physics.

For abstract, see STAR 1208

SRARI-P-191 PC$3.75/MF$1.45
Nauchno-Issledovatel'Skij Inst. Atomnykh Reaktorov, Dimitrovgrad (Ussr).
NATURAL CIRCULATION IN PARALLEL CHANNEL SYSTEMS OF NUCLEAR POWER PLANTS.
S. A. Markin, K. A. Aleksandrov, and N. V. Krasnoyarov. 1973, 32p
In Russian. U.S. Sales Only.

Descriptors: (*Fuel channels, *Natural convection), (*Primary coolant circuits, *Fluid flow), Cooling, Nuclear power plants.

For abstract, see NSA 29 07, number 17702.

18N. Snap Technology

ANL-6758 PC$4.50/MF$1.45
Argonne National Lab., Ill. (Usa).
NUCLEAR THERMIONIC CONVERTERS FOR SPACE POWER.
J. C. Carter, A. J. Ulrich, and R. H. Armstrong. Aug 63, 50p
Contract W-31-109-eng-38

Descriptors: (*Space power reactors, Thermionic converters), (*Thermionic converters, *Design), Configuration, Efficiency, Performance.

For abstract, see NSA 29 07, number 17653.

GE-TM-65-11-7 PC$3.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
EXP 244 CM AND EXP 238 PU CRITICALITY ANALYSIS. APPENDIX B.
13p
Contract AT(40-1)-2847

Descriptors: (*Curium 244, *Criticality), (*Plutonium 238, Criticality), Radioisotope heat sources.

For abstract, see NSA 29 07, number 15801.

GESR-2105 PC$10.75/MF$1.45
General Electric CO., Pleasanton, Calif. (Usa). Nuclear Thermionic Power Operation.
DEVELOPMENT OF A NUCLEAR THERMIONIC FUEL ELEMENT. ANNUAL SUMMARY AND TWENTY-FIRST QUARTERLY PROGRESS REPORT, JULY 1, 1967–SEPTEMBER 30, 1967.
1967, 172p
Contract AT(04-3)-189

Descriptors: (*Thermionic reactors, Fuel elements), (*Fuel elements, *Testing), Fabrication, Irradiation, Materials testing, Thermionic converters.

For abstract, see NSA 29 07, number 17654.

GESR-2112 PC$6.25/MF$1.45
General Electric CO., Pleasanton, Calif. (Usa). Nuclear Thermionic Power Operation.
THERMIONIC FUEL ELEMENT IN-PILE TEST TECHNIQUES.
A. F. Jr. Clark, and D. L. Gilliland. Jun 68, 81p
Contract AT(04-3)-189

Descriptors: (*Thermionic reactors, Fuel elements), (*Fuel elements, *Performance testing), Design, Irradiation capsules.

For abstract, see NSA 29 07, number 17655.

GKSS-73-E-16 PC$4.00/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Geesthacht-Tesperhude (F.R. Germany).
MEASUREMENTS OF WATER CONTENT OF STEAM AND DRAINAGE WITHIN THE WET STEAM REGIME OF THE TURBINE. RESEARCH REPORT NO. 16.
H. Boie, and B. Holz. 1973, 40p
In German. U.S. Sales Only.

Descriptors: (*Otto hahn reactor, *Steam quality), Efficiency, Performance, Reactor operation, Steam turbines, Water.

For abstract, see NSA 29 07, number 17656.

MND-3169-16-A PC$3.75/MF$1.45
Martin Marietta Corp., Baltimore, MD. (Usa).
SNAP 19C-2 SAFETY REPORT.
T. W. Conway, and T. J. Dobry. Nov 65, 34p

Descriptors: (*Snap 19 battery, *Safety), (*Thermoelectric generators, Safety), Arctic regions, Operation, Plutonium 238, Radiation protection, Radioisotope heat sources, Testing, Transport.

For abstract, see NSA 29 07, number 15802.

N74-16804/8GA PC$4.00/MF$1.45
General Electric Co., Cincinnati, Ohio.
DEVELOPMENT OF A MERCURY ELECTROMAGNETIC CENTRIFUGAL PUMP FOR THE SNAP-8 REFRACTORY BOILER DEVELOPMENT PROGRAM.
Final Report.
R. A. Puller, and A. W. Schnacke. Feb 74, 77p
NASA-CR-2375
Contract NAS3-10610

Descriptors: *Electromagnetic pumps, *Snap 8, Boilers, Ducts, High pressure, Mercury (Metal), Performance tests, Refractory metals.

For abstract, see STAR 1208

WANL-TME-1547 PC$4.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Astronuclear Lab.
STATUS REPORT ON NERVA REACTOR MODEL FOR SYSTEMS ANALYSIS.
R. M. Lynch, P. J. Blake, and R. S. Bell. 1966, 47p

Descriptors: (*Nerva reactor, *Reactor kinetics), Mathematical models, Thermodynamics.

For abstract, see NSA 29 07, number 17666.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-776 388/1GA PC$9.25/MF$1.45
Systems Science and Software La Jolla Calif
RESEARCH STUDY AND ANALYSIS FOR IMPROVEMENT OF SHAPED CHARGE CODE.
Final rept. Jun 72-Aug 73,
R. T. Sedgwick, M. S. Chawla, J. L. Waddell, L. J. Walsh, and D. E. Wilkins. Mar 74, 122p Rept no. SSS-R-73-1862 BRL-CR-140
Contract DAAD05-72-C-0291

Descriptors: *Shaped charges, Subroutines, Cavity liners, Shaped charge jets, Interior ballistics, Experimental design.

The BRL Shaped Charge code has been modified to allow the solution of the liner collapse and jet formation process associated with shaped charges containing bimetallic liners and wave shapers. Major improvements to the code include improved generators and detonation subroutines, slip stream capabilities and grid packaging. The latter improvement allows a finely zoned grid in the jet formation region to communicate with a surrounding coarsely zoned grid, thus saving calculational time without forfeiting resolution in the jet formation region. The improved code was used to solve three shaped charge configurations of interest to the BRL. (Author)

AD-776 389/9GA PC$4.00/MF$1.45
Rock Island Arsenal Ill General Thomas J Rodman Lab
RIFLE-GAS LAUNCHED GRENADE CONCEPT.
Technical rept.,
Robert E. Duncan. Sep 73, 77p Rept no. R-RR-T-3-74-73

Descriptors: *Rifle grenade launchers, Feasibility studies, Interior ballistics, Gases, Propellants, Cost effectiveness, Muzzle velocity, Mathematical models.

The report describes a feasibility study on a novel approach for launching a 40mm grenade. The study was undertaken with the goal of conceiving and developing a future grenade launcher which would be applicable to the Future Rifle System Program. This program advocates a weapon system which is a combination of both a rifle (point fire) and a grenade launcher (area fire). To maximize integration of the launcher to the rifle design, it was theorized to utilize rifle propellant gases to launch a grenade projectile. The proposed concept would provide for reduced grenade ammunition costs, reduced number of launcher component parts, lighter total weapon system weight, and more grenade rounds per combat load. A concept which contained all of the above features was generated, designed, fabricated, and tested. The report describes the various facets which went into each stage of its development. (Modified author abstract)

AD-776 502/7GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INCENDIARY SUBSTANCES AND DEVICES FOR THEIR USE.
P. G. Yurev. 29 Oct 73, 19p Rept no. FSTC-HT-23-1040-71
Trans. from Vsesoyuznoe Khimicheskoe Obshchestvo. Zhurnal (USSR).

Descriptors: *Incendiary ammunition, USSR, Reviews, Translations.

Devices used in conjunction with incendiary substances are discussed.

AD-776 579/5GA PC$7.75/MF$1.45
Naval Weapons Lab Dahlgren Va

ENGINEERING EVALUATION PLAN FOR THE 5 IN./54 HIGH FRAGMENTATION PROJECTILE.
Administrative rept.,
Albert F. Riedl, III. Jan 74, 92p Rept no. NWL-AR-125

Descriptors: *Fragmentation ammunition, *Projectiles, Interior ballistics, Cook off, Exterior ballistics, Safety, Storage.

A plan is presented for the Engineering Evaluation of the 5 in./54 High Fragmentation Naturally Fragmenting Projectile.

AD-776 958/1GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J
EXPLOSION HAZARD CLASSIFICATION OF DROWNING TANK MATERIAL FROM TNT MANUFACTURING PROCESS.
Technical rept.,
Robert Persurance. Jan 74, 20p Rept no. PA-TR-4613

Descriptors: *TNT, *Manufacturing, *Hazards, Explosives, Processing, Water tanks, Nitrates, Solutions(Mixtures).

The study was undertaken to establish the explosion hazard classification that should be assigned to the drowning tank material that accumulates in the TNT manufacturing processes used in this country. Nitrobody samples of drowning tank material were obtained from both a batch and a continuous process, analyzed by gas chromotography to characterize them with respect to composition, and tested in a series of explosion hazard evaluation tests in accordance with Technical Bulletin 700-2, 'Explosives Hazard Classification Procedures', 19 May 1967. In addition to the required tests (Detonation, Ignition and Unconfined Burning, Thermal Stability, Impact Sensitivity, and Card Gap) - Water Gap and Detonation Velocity tests were performed. Explosion hazard classifications for the drowning tank material were recommended. (Author)

AD-777 000/1GA PC$3.75/MF$1.45
National Materials Advisory Board (Nas-Nae) Washington D C
ALTERNATE PRODUCTION PROCESSES FOR FUZE PINIONS.
Final rept.
Jan 74, 65p Rept no. NMAB-311
Contract DAAA25-73-C-0316

Descriptors: *Projectile fuzes, *Gears, Production, Processing, Casting, Moldings, Powder metallurgy, Etching, Chemicals, Diffusion bonding, Fuzes(Ordnance).
Identifiers: *Pinions.

A study was conducted of possible methods for producing small pinions that would not involve use of imported machinery or scarce skills. Four methods were identified: zinc die casting, plastic molding, powder compaction, and chemical etching/diffusion bonding. All processes are probably economically competitive, but each has some limitations, which are outlined. Additional recommendations of a more general nature are included. (Author)

N74-17640/5GA PC$4.75/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
HEAT TRANSFER MODEL FOR PREDICTING SQUIB IGNITION TIMES.
V. Sernas. 15 Jan 74, 32p NASA-CR-136834, JPL-TM-33-655
Contract NAS7-100

Descriptors: *Heat transfer, *Ignition, *Squibs, Mathematical models, Pyrotechnics, Solid propellants, Thermodynamics, Wire bridge circuits.

For abstract, see STAR 1208

19D. Explosions, Ballistics, and Armor

AD-776 457/4GA Reprint
California Univ Berkeley Coll of Engineering
PHOTOGRAPHIC LABORATORY STUDIES OF EXPLOSIONS,
M. M. Kamel, and A. K. Oppenheim. 1973, 16p AFOSR-TR-74-0375
Grants AF-AFOSR-2200-72, NGL-05-003-050
Prepared in cooperation with Cairo Univ. (Egypt). Mechanical Power Engineering. Sponsored in part by Grant NSF-GK-22975.
Availability: Pub. in l'Aerotecnica Missili e Spazio (Milano, Italy), v2 p122-134 1973.

Descriptors: *Gas dynamics, *Explosions, *Holography, Ruby lasers, Explosive gases, Flame propagation, Detonations, Mechanical waves, Stroboscopic light sources.
Identifiers: Acetylene.

The paper describes apparatus developed at the University of California in Berkeley and results obtained by the authors, with cinematographic studies of explosions, made by means of a high-speed rotating mirror streak camera using a high-frequency stroboscopic ruby laser as the light source. The results pertain primarily to explosions, initiated by focused laser irradiation from a pulsed neodymium laser, in detonative gases consisting primarily of an equimolar acetylene-oxygen mixture at an initial pressure of 100 torr. and room temperature. A number of heretofore unpublished phenomena are included. Most prominent among them are the following events: spherical blast wave headed by a Chapman-Jouguet detonation established right upon the initiation, merging of a spherical flame with a shock front of the blast wave within which the flame is propagating, decoupling of a spherical detonation front into a shock and a flame, and generation of shock waves by a spherical flame kernel. (Modified author abstract)

AD-776 915/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON DETERMINATION OF THE REGION OF SURFACE ELASTIC WAVE FORMATION,
O. O. Vovk, A. O. Kuzmenko, and A. G. Smirnov. 12 Mar 74, 13p Rept no. FTD-HC-23-665-74
Edited trans. of Akademiya Nauk URSR, Kiev. Dopovidi. Seriya B: Geologiya, Geofizyka, Khimiya ta Biologiya, n4 p344-347 1972.

Descriptors: *Seismic waves, *Surface waves, *Soil mechanics, Explosion effects, Elastic waves, Translations, USSR.

It is evident that a detonation, in particular in compressible soils, causses the formation both of straight, longitudinal (circumferential) and surface waves of various types (this article is concerned with surface waves of a topographical type). The experimental part investigated was performed at the experimental detonation base of the Academy of Sciences of the Ukrainian SSR in loamy soils with a volumetric charge of 1.9 g/sq cm and with natural moisture of 22-25% using a seismic apparatus (the detectors VBP-III, VIB-A, VEGIK, and the N-700 oscillographs).

AD-776 917/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PENETRATION OF AERIAL BOMBS INTO SOILS AND THE SEISMIC EFFECTIVENESS OF THE EXPLOSIONS,
S. V. Potapev. 25 Mar 74, 11p Rept no. FTD-HT-23-918-74
Edited trans. of Geologiya i Geofizika (USSR) n3 p110-113 1973, by K. L. Dion.

Descriptors: *Bombs, *Terminal ballistics, Translations, Soils, Cratering, Penetration, Seismic waves, Excavation, USSR.

The report presents a generalized discussion of bomb penetration of soils. The aerial bombs are used for excavation work.

AD-776 937/5GA PC$3.75/MF$1.45
Defence Research Establishment Valcartier Quebec
COMPARISON OF A NEW MODEL FOR INTERNAL BALLISTICS WITH A CONVENTIONAL MODEL,
J. T. Bedard, and G. J. Gallagher. Aug 73, 63p Rept no. DREV-R-644/73
Summary in French.

Descriptors: *Gun barrels, *Interior ballistics, Mathematical models, Gun propellants, Burning rate, Gas dynamics, Conservation, Numerical analysis, Canada.

The report compares two models for describing internal ballistics: one model is of the conventional type and is based on the equations of Hunt and Hinds, with a modification to incorporate the possibility of a nonlinear burning rate. The other is a new model based on a partial differential equation description of a one-dimensional unsteady flow. The report contains an analysis of the hypotheses of each model and a comparison with experimental measurements of their predictions under conditions of different charge weight to projectile weight ratios as well as different rates of burning. (Modified author abstract)

AD-776 999/5GA PC$5.75/MF$1.45
FMC Corp San Jose Calif Ordnance Engineering Div
WELDING STUDY OF ELECTROSLAG REMELTED STEEL ARMOR.
Final rept. 14 May 73-23 Jul 74,
Ronald E. Musante, William C. Schultz, and Loren L. Lanier. Jan 74, 51p AMMRC-CTR-74-10
Contract DAAG46-73-C-0195

Descriptors: *Armor, *Gas metal arc welding, Steel, Welds, Fillers, Wire.
Identifiers: Steel 4340, Electroslag remelting.

The purpose of the project was to study welding of electroslag remelted (ESR) steel with high strength filler wires. This report gives a detailed description of welding techniques developed, and a metallurgical and ballistic evaluation of the welds obtained. ESR steel armor at hardnesses suitable for armor piercing projectile protection (514 BHN) was successfully welded. The welds have excellent mechanical and ballistic properties. Welding of ESR 4340 steel with the gas metal-arc welding (GMAW) process, using type 14C welding wire and argon-oxygen (98-2) shield gas, appears to offer no unusual welding problems. Normal good shop practices, using the tempering weld pass technique, will result in welds of high quality. (Author)

LA-5131 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PRESSURE MEASUREMENTS ON THE SHOCK-INDUCED DECOMPOSITION OF HIGH-DENSITY PETN.
J. Wackerle, and J. O. Johnson. Nov 73, 23p
Contract W-7405-eng-36

Descriptors: (*Petn, *Explosions), Impact shock, Pressure dependence, Shock waves, Time dependence.

For abstract, see NSA 29 07, number 18020.

19F. Guns

AD-776 306/5GA PC$3.00/MF$1.45
Army Electronics Command Fort Belvoir Va Night Vision Lab
LASER AIMING LIGHT.
Final rept. Jan 71-Mar 73,
Michael Hacskaylo. Jan 74, 17p ECOM-7031

Descriptors: *Small arms, *Gun sights, *Light emitting diodes, *Semiconductor lasers, Gallium arsenides, Aluminum compounds, Gallium arsenide lasers, Infrared lasers, Night vision, Gun components, Light weight, Aiming.

The laser aiming light (LAL) for use with small arms was developed and field tested. The aiming light was designed with advanced state-of-the-art components consisting of a room temperature laser diode, low impedance laser diode mount, and microelectronic pulser. The LAL has an emission wavelength ranging from 820 to 850 nanometers for use with night vision goggles. The LAL housing is single structured, that is, 6.25 inches long, 0.78 inch diameter, with a 1.20-inch-diameter lens compartment; the LAL weighs 7.87 ounces. The LAL is powered by an 11.2-volt battery, and the average optical output power ranges from 50 to 350 microwatts. The aiming light has a boresight mechanism that interfaces with the rifle adapter. The LAL was field tested on the M-16 rifle in the single as well as rapid-fire mode and did not exhibit degradation. The laser aiming light is considered to be eye-safe. (Author)

AD-776 514/2GA PC$3.75/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INSTRUCTIONS REGARDING MILITARY ENGINEERING REQUIREMENTS FOR ALL TROOPS OF THE SOVIET ARMY.
6 Nov 73, 64p Rept no. FSTC-HT-23-1024-70A
Trans. of unidentified Russian language mono., pub. by Ministry of Defense USSR, Moscow, 1952.

Descriptors: *Artillery, *Military engineering, USSR, Trenching, Translations.

The article describes the military engineering requirements for the construction of pits for observation posts and cover for field artillery. (Author)

AD-776 576/1GA PC$3.00/MF$1.45
Naval Ordnance Station Louisville Ky
ELECTRON BEAM WELDING OF BREECH BLOCK GUIDES FOR THE 5 INCH/54 CAL. MK 42 MOD 10 GUN MOUNT PROGRAM.
Final rept.
Dec 73, 25p Rept no. NOSL-MT-023

Descriptors: *Gun mounts, *Guides, *Electron beam welding, Breech mechanisms, Mounts, Reclamation, Degradation.
Identifiers: Breech block guides.

The report presents the results of an examination of the repair and reclamation of breech block guides for major caliber gun mounts using electron beam welding. The left and right hand aluminum bronze guides are subjected to degradation from contamination with propellant residue and the lack of lubrication and proper maintenance. During the conversion program, the blocks are examined and those with significant degradation are deemed unfit for further service. The study examined a repair scheme; to remove the worn portion and replace it with new material integrally joined by electron beam welding. The successful repair method is described and illustrated. The technical information is brief, as it is intended that it should be used only as a guide for similar work. (Author)

AD-776 956/5GA PC$3.25/MF$1.45
Rock Island Arsenal Ill General Thomas J Rodman Lab
A STUDY OF THE DIFFUSION ZONE BETWEEN TA-10W TANTALUM ALLOY AND 4150 STEEL.
Technical rept.,
Robert C. Tooke, and Joseph D. DiBenedetto. Oct 73, 41p Rept no. R-RR-T-1-76-73

Descriptors: *Gun barrels, Steel, Linings, Tantalum alloys, Tungsten alloys, Diffusion.
Identifiers: Tantalum alloy 10W, Steel 4150.

Because of the erosive conditions to which barrel materials are subjected during the rapid firing of guns, materials for barrels had to be improved. One such improvement involved the lining of the bore of an AISI 4150 steel barrel with a tantalum alloy (Ta-10W). The Ta-10W alloy liner and the 4150 steel were coextruded at 1900 degrees F to form a multilayer gun tube. The extrusion produced a satisfactory bond, mechanical and metallurgical in nature, between the steel and refractory alloy liner. Although detrimental effects during test firing cannot be attributed to the diffusion zone, this zone could be a potential trouble area. Consequently, information pertaining to the diffusion zone was desirable.

20. PHYSICS

20A. Acoustics

AD-776 583/7GA PC$3.00/MF$1.45
Saclant ASW Research Centre La Spezia (Italy)
CALCULATION OF RMS SLOPE OF CARRIER WAVES IN A COMPOSITE-ROUGHNESS SEA SURFACE MODEL,
Wolfgang Bachmann. 15 Jan 74, 22p Rept no. SACLANTCEN-SM-38

Descriptors: *Acoustic scattering, *Ocean surface, Surface roughness, Radar signals, Sonar signals, Underwater sound, Backscattering, Standard deviation, Italy.

For calculating RADAR clutter or SONAR reverberation from the sea surface, the best results are achieved by applying a composite-roughness model. The underlying idea is that the small wavelets ('ripples') primarily responsible for the backscattering are carried by longer waves with higher amplitudes ('swell'), which affect the scattering process in a non-linear way. It has been shown in a previous paper that the parameter describing the coupling of the long- and short-wave scattering is the rms slope of conceptual 'facets' on the long waves. This paper develops methods for determining a suitable facet length and for calculating the rms facet slope. (Author)

AD-776 608/2GA Not available NTIS
Saclant ASW Research Centre La Spezia (Italy)
INTENSITY CALCULATIONS ALONG A SINGLE RAY,
Hans R. Krol. 17 Nov 71, 8p Rept no. SACLANTCEN-SR-2
Availability: Pub. in the Jnl. of the Acoustical Society of America, v53 n3 p864-868 1973.

Descriptors: *Sound transmission, Intensity, Formulas(Mathematics), Italy, Underwater sound.

A method is presented for the calculation of sound intensity using only one ray. The sound-velocity profile is assumed to be continuous up to the second derivative and it is supposed that the ray equations are solved numerically. An example is given. (Author)

AD-776 654/6GA PC$3.25/MF$1.45
Institute for Acoustical Research Miami Fla
LONG PERIOD FLUCTUATIONS OF CW SIGNALS IN DEEP AND SHALLOW WATER.
Interim rept. no. 1, Jul-Dec 72,
John G. Clark, and Morton Kronengold. 11 Feb 74, 47p Rept no. IAR-74001
Contract N00014-73-C-0014

Descriptors: *Underwater sound signals, Phase studies, Sound transmission, Continuous waves, Variations, North Atlantic Ocean.
Identifiers: MIMI project.

In July 1972 as part of the cooperative studies between the Miami and Michigan Project MIMI research groups, continuous fixed system underwater sound propagation tests at 406 Hz were commenced between a sound source off Eleuthera, Bahamas and receivers at Bermuda, a distance of 1250 kilometers, and at positions intermediate in range with respect to the 1250 kilometer path. Preliminary studies of long period cw transmission fluctuations at Bermuda and at one intermediate position have been completed. Phase fluctuations associated with the ocean tides are a marked feature of the data. With averages taken over two day time spans, significant variations in the statistical properties of transmission loss have been observed over a 5 month time period. Shorter period fluctuations in acoustic phase (time scale of a few minutes to a few hours) have similar characteristics in the deep and shallow water propagation ranges. (Modified author abstract)

AD-776 655/3GA PC$4.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
TECHNICAL EVALUATION REPORT ON FLUID DYNAMICS PANEL SPECIALISTS MEETING ON NOISE MECHANISMS.
Advisory rept.,
J. E. Ffowcs Williams. Feb 74, 19p Rept no. AGARD-AR-66
Meeting held at Brussels, Belgium, 19-21 Sep 73. Proceedings published as rept. no. AGARD-CP-131. NATO furnished.

Descriptors: *Aircraft noise, *Meetings, Flow fields, Turbulence, Noise reduction, Jet engine noise, Propagation, Aerodynamic noise.
Identifiers: Noise sources.

Contents:
Source identification;
The influence of mean flow structure on the generation and propagation of sound;
Distinctive large eddy structures:
Are they deterministic events;
Excess noise;
The control of jet noise;
Problem areas likely to become more important;
Recommendations.

AD-776 678/5GA Reprint
Saclant ASW Research Centre La Spezia (Italy)
THE WAVE EQUATION IN A MEDIUM WITH A TIME-DEPENDENT BOUNDARY,
Leonard Fortuin. 1 Dec 72, 6p Rept no. SACLANTCEN-SR-3
Revision of report dated 19 Oct 72.
Availability: Pub. in The Jnl. of the Acoustical Society of America, v53 n6 p1683-1685 1973.

Descriptors: *Underwater sound, *Sound transmission, Wave equations, Probability density functions, Italy.
Identifiers: Helmholtz equation.

It is shown that the Helmholtz equation is not exactly correct for a medium with a time-dependent boundary. The equation can be used with very good approximation when the time-derivative of the surface elevation is much smaller than the speed of the waves through the medium. For underwater sound waves, reflected and scattered by an ocean surface that can be described by the Pierson-Moskowitz spectrum, this means that the wind speed has to be much less than the sound speed. (Author)

AD-776 679/3GA Reprint
Saclant ASW Research Centre La Spezia (Italy)
SOME RAY AND INTENSITY SOLUTIONS IN THE COMPLEX PLANE,
Hans R. Krol. 14 Nov 72, 6p Rept no. SACLANTCEN-SR-4
Availability: Pub. in The Jnl. of the Acoustical Society of America, v54 n1 p96-98 1973.

Descriptors: *Underwater sound, *Sound transmission, *Ray tracing, Complex variables, Analytic functions, Italy.

The paper presents a method to test range-dependent ray-tracing programs. The method is based on complex-function theory. From an analytic function that has a zero point at the emitter, expressions for sound speed, ray paths, travel time, and intensity can be derived. The intensity expression is very simple and also applicable to caustic points. Two examples are given. (Author)

AD-776 680/1GA Reprint
Saclant ASW Research Centre La Spezia (Italy)
A THEORETICAL MODEL FOR THE BACKSCATTERING STRENGTH OF A COMPOSITE-ROUGHNESS SEA SURFACE,
Wolfgang Bachmann. 28 Feb 73, 8p Rept no. SACLANTCEN-SR-5
Availability: Pub. in the Jnl. of the Acoustical Society of America, v53 n3 p712-716 1973.

Descriptors: *Underwater sound, *Acoustic scattering, *Ocean surface, Sea states, Surface roughness, Backscattering, Italy.

The surface-backscattering strength is calculated according to Rayleigh theory for surface excursions much smaller than the sound wavelength. By taking account of self-shadowing and modulation of grazing angles, the validity of the result is extended to arbitrary roughness. The predictions of this new composite-roughness scattering model are compared with a small set of experimental data. (Author)

JPRS-61489 PC$4.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
HYDROACOUSTICAL MEASUREMENTS IN OCEANOLOGY,
E. S. Taranov. 15 Mar 74, 80p
Trans. of mono. Gidroakusticheskie Izmereniya v Okeanologii, Leningrad, 1972 p211-243, 280-322.

Descriptors: *Underwater sound equipment, *Oceanography, Spectrum analyzers, Acoustic filters, Signal to noise ratio, Ocean bottom, Translations, USSR.

Contents:
- Spectral analysis of noise and interference in hydracoustics;
- Measurement of sound velocity and of losses in ground;
- Statistical acoustic measurements.

N74-16725/5GA PC$8.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. Particulate Dynamics Div.
SONIC BOOM MEASUREMENTS FROM ACCELERATING SUPERSONIC TRACKED SLEDS.
J. W. Reed. Jan 74, 107p NASA-CR-132388, SLA-73-714
NASA ORDER L-75054, Contract AT(29-1)-789

Descriptors: *Rocket propelled sleds, *Shock waves, *Sonic booms, *Supersonic speeds, Aerodynamic noise, Noise propagation, Numerical analysis, Pressure distribution, Sound waves.

For abstract, see STAR 1208

N74-16728/9GA PC$4.50/MF$1.45
Graham Associates, Shaw Island, Wash.
THEORETICAL STUDY OF THE EFFECTS OF REFRACTION ON THE NOISE PRODUCED BY TURBULENCE IN JETS.
Final Report.
E. W. Graham, and B. B. Graham. Mar 74, 104p NASA-CR-2390
Contract NAS1-11533

Descriptors: *Acoustic properties, *Aerodynamic noise, *Air flow, *Jet flow, *Turbulent flow, Flow characteristics, Flow equations, Numerical analysis.

For abstract, see STAR 1208

N74-16994/7GA PC$4.25/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE DESIGN AND CONSTRUCTION OF AN ANECHOIC CHAMBER LINED WITH PANELS FOR INVESTIGATION OF AERODYNAMIC NOISE.
J. P. Berhault, M. Sunyach, H. Arbey, and G. Comte-bellot. Jan 74, 22p NASA-TT-F-15243
Contract NASW-2483
Tran-Transl. Into English from Acustica (West Germany), V. 29, No. 2, 1973 2 p 69-78.

Descriptors: *Aerodynamic noise, *Anechoic chambers, *Glass fibers, *Linings, Acoustics, Free jets, Nozzle walls, Pressure.

For abstract, see STAR 1208

20B. Crystallography

AD-776 330/3GA PC$6.50/MF$1.45
Harry Diamond Labs Washington D C
RARE EARTH ION-HOST LATTICE INTERACTIONS. 1. POINT CHARGE LATTICE SUM IN SCHEELITES,
Nick Karayianis, and C. A. Morrison. Oct 73, 68p Rept no. HDL-TR-1648

Descriptors: *Rare earth compounds, *Crystal structure, Lattice parameters, Computer programs, FORTRAN.
Identifiers: Legendre functions.

The procedure for performing a point charge lattice sum in scheelite-type crystals (including zircon structure crystals) is discussed, and convergence of the sums for various A(nm) is investigated. It is concluded that including charges only within a given radius (spherical sums) gives faster convergence than rectangular sums. Spheres of radii 25A and 70A are sufficient for A(nm) with n > or = 3 and n = 2, respectively. A listing of a Fortran computer program that performs the spherical sums is given, and the results for several scheelite and zircon structure crystals are given. Explicit expressions for associated Legendre polynomials, P(nm), for n < or = 9 are also included for reference. (Author)

AD-776 429/3GA Reprint
Hughes Research Labs Malibu Calif
CRYSTAL GROWTH OF AIIBIVC2V CHALOCOPYRITES,
A. L. Gentile, and O. M. Stafsudd. 10 Dec 73, 12p AROD-9664.3-P
Contract DAHC04-71-C-0028
Prepared in cooperation with California Univ., Los Angeles.
Availability: Pub. in Materials Research Bull., v9 p105-116 1974.

Descriptors: *Crystal growth, *Arsenides, *Phosphides, Synthesis(Chemistry), Infrared radiation, Zinc compounds, Germanium compounds, Silicon compounds, Cadmium compounds, Single crystals.
Identifiers: *Infrared upconversion, Zinc germanium phosphides, Zinc silicon arsenides, Cadmium germanium arsenides, Zinc phosphides.

Crystal growth techniques were investigated for the synthesis of A(2)B(4)C2(5) chalcopyrites. High quality single crystals of ZnGeP2 were grown by a Bridgman techaique; samples showed near-theoretical transmission in the 3 to 8 micrometer range. The Bridgman technique was also applied to the growth of ZnSiAs2 and CdGeAs2. A controlled reaction process was developed for syntheais of compounds containing volatile constituents, and demonstrated for ZnP2, and intermediate in the preparation of ZnSiP2 and ZnGeP2. A single-stage procedure in which the constituent elements are reacted and crystal growth ensues by vapor transport under a controlled overpressure of phosphorus was also pursued for ZnSiP2. (Author)

AD-776 998/5GA Reprint
Brown Univ Providence R I Dept of Chemistry
CRYSTAL GROWTH AND CHARACTERIZATION OF PtP2,
Aslan Baghdadi, Arlington Finley, Peter Russo, Ronald J. Arnott, and Aaron Wold. 19 Jun 73, 10p AROD-6079.22-MC
Grant DA-ARO-D-124-73-G13
Availability: Pub. in Jnl. of the Less-Common Metals, v34 p31-38 1974.

Descriptors: *Crystal growth, Platinum compounds, Phosphides, Single crystals, Crystal lattices, Electrical properties.
Identifiers: *Platinum phosphides.

Large well-formed crystals of platinum diphosphide, PtP2, were grown from a tin flux. These crystals were shown to be of good quality by magnetic, density, and crystallographic measurements. However, the presence of tin (0.02%) as an impurity prevented meaningful measurement of the electrical properties of PtP2. The crystals were found to be diamagnetic, with a susceptibility of -64 x 10 to the minus 6th power emu/mole. The positions of the phosphorus atoms within the crystal structure were re-determined by measuring the intensities of 32 X-ray reflections. The P-P bond distance was then calculated to be 2.22(2) A. (Author)

AD-776 859/1GA Reprint
Illinois Univ Urbana Coordinated Science Lab
DIRECT VISUALIZATION OF ADATOM SITES ON A CRYSTAL,
W. R. Graham, and Gert Ehrlich. 14 Jun 73, 4p AFOSR-TR-74-0397
Grant AF-AFOSR-2210-72
Availability: Pub. in Jnl. of Chemical Physics, v59 n6 p3417-3418, 15 Sep 73.

Descriptors: *Surfaces, *Tungsten, Crystals, Microscopy, Field emission, Adsorption, Atomic structure.
Identifiers: *Field ion microscopy, Body centered cubic lattices.

The location of a single tungsten atom on the (111) plane of a tungsten crystal has been studied using low temperature field ion microscopy. In this, the first direct determination of an adsorption site on a crystal, it has been established that usually the adsorbed atom is held on the (111) surrounded by 3 nearest neighbor atoms in the first lattice layer and by a fourth in the third layer of the crystal. (Author)

AD-776 800/7GA Reprint
Duke Univ Durham N C Dept of Physics
ORTHO-PARA CONVERSION RATE IN SOLID HYDROGEN UNDER PRESSURE,
P. Pedroni, H. Meyer, F. Weinhaus, and D. Haase. 31 Oct 73, 4p
Summary in French. Sponsored in part by Office of Naval Research, Arlington, Va. and Army Research Office-Durham.
Availability: Pub. in Solid State Communications, v14 n3 p279-281 1974.

Descriptors: *Hydrogen, Nuclear spins, Spectrum analysis, Phonons, Solidified gases.
Identifiers: *Solid hydrogen, Parahydrogen, Orthohydrogen.

The authors report new measurements of the ortho-para conversion rate in solid H2 at 4.2K. The conversion rate shows evidence of two maxima. A qualitative discussion of this behavior is presented in terms of the theory of phonon creation during the conversion, and this discussion shows the consistency between the observed maxima and the shape of the phonon spectrum. (Modified author abstract)

N74-17472/3GA PC$6.25/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (Fraace).

GENERAL STUDY OF LIQUID PHASE EPITAXY OF GROUP III-V AND IV-VI BINARY AND TERNARY COMPOUNDS ETUDE GENERALE DEL'EPITAXIE EN PHASE LIQUIDE DE COMPOSES BINAIRES ET TERNAIRES GROUPES III-V ET IV-VI RAPPORT FINAL.
Final Report.
N. Sol, M. Faure, and M. Moulin. 1972, 61p
Contract DGRST-70-7-2416
Language in French.

Descriptors: *Binary mixtures, *Crystal surfaces, *Epitaxy, *Geometry, *Ternary systems, Antimony, Gallium arsenides, Lead (Metal), Liquidus, Purity, Selenium, Solidus, Thermal stability.

For abstract, see STAR 1208

PATENT-3 154 381 Not available NTIS
Department of the Interior, Washington, D.C.
PROGRESSIVE MELTING AND CRYSTALLIZATION OF SYNTHETIC MICA.
Patent,
Haskiel R. Shell, and Norman A. Pace. Filed 20 Apr 59, patented 27 Oct 64, 5p PAT-APPL-807 737, DOCKET/MIN-311
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Crystal growth, *Mica, *Patents, Melting, Crystallization, Synthesis.
Identifiers: PAT-CL-23-110.

The patent relates to a method and apparatus for the production of crystals by melting and solidifiying batches of starting ingredients. More particularly, it is concerned with a method and apparatus for preparing synthetic mineral crystals, especially crystals of synthetic fluorine mica.

PATENT-3 222 142 Not available NTIS
Department of the Interior, Washington, D.C.
SYNTHESIS OF LARGE CRYSTALS OF FLUORPHLOGOPITE MICA.
Patent,
Haskiel R. Shell, Norman A. Pace, Norris Nichols, and Earl F. Nichols. Filed 10 Sep 63, patented 7 Dec 65, 3p PAT-APPL-303 036, DOCKET/MIN-514
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Phlogopite, *Fluorides, *Patents, Mica, Single crystals.
Identifiers: PAT-CL-23-302, *Fluorphlogopite.

It is the object of the present invention to provide a simple, economical method of producing large single crystals of synthetic minerals or chemicals, particularly mica, in quantity in a high state of purity. This objective may be accomplished by means of a process in which the vessel containing the melt, from which the crystals are formed, is maintained in a constant state of continuous or periodic motion. The resulting motion of the liquid melt within the vessel produces a continuous or periodic replenishment of the liquid phase about the growing crystals, thus removing excessive accumulations of F(-), Na(+) and Ca(++) as well as wrong-ratio mica components themselves.

20C. Electricity and Magnetism

AD-776 751/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
COMPARATIVE STUDY OF THE ELECTRICAL OSCILLATIONS IN POSITIVE AND NEGATIVE COLUMN IN A D.C. GLOW DISCHARGE,
D. Grosu, and X. Grosu. 21 Mar 74, 22p Rept no. FTD-HC-23-1340-74
Edited trans. of Academia Republicii Populare Romine. Institutul de Fiziologie Normala si Pathologica. Studii si Cercetari de Fiziologie (Rumania) v22 n4 p409-420 1970.

Descriptors: *Glow discharges, Gas ionization, Magnetic fields, Oscillation, Translations, Rumania.

Contents: Form, frequency, and amplitude of the electrical oscillation, the dependence of the electrical oscillation frequency on the length of the ionized column, dependence of the electrical oscillation frequency on the anode diameter, the influence of the voltage applied on the tube upon electrical oscillation frequency, the dependence of the electrical oscillation frequency on the tube diameter, influence of the tube discharge capacity upon the frequency of the electrical oscillation, and magnetic field influence on the electrical oscillation.

JPRS-61504 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
EXPERIMENTAL STUDY OF THE CHARACTERISTICS OF ELECTRICAL DISCHARGE BETWEEN COAXIAL COPPER ELECTRODES IN A MAGNETIC FIELD,
V. I. Alferov, O. N. Vitkovskaya, Yu. S. Ustinov, and G. I. Shcherbakov. 18 Mar 74, 6p
Trans. of Teplofizika Vysokikh Temperatur (USSR) v11 n6 p1142-1146 1973.

Descriptors: *Electric discharges, Magnetic fields, Electrodes, Copper, Ion sources, Translations, USSR.

The report contains results of experimental investigations of electrical discharge in the annular gap between cooled copper electrodes. Empirical formulas are presented for determination of discharge voltage and discharge velocity in an annular gap.

20D. Fluid Mechanics

AD-776 401/2GA PC$3.00/MF$1.45
Pennsylvania State Univ University Park Systems and Controls Lab
RESEARCH REPORT NO. 16 UNIVERSITY PARK, PA. JULY, 1973,
Gary V. Smith, W. D. Mangieri, Huan C. Tran, and R. Yaros. Jul 73, 14p Rept no. PSU-SCL-16(73A)
Contract DAAG39-72-C-0190, Grant NGR-39-009-023
See also N70-15607.

Descriptors: *Aerospace systems, *Scientific research, *Fluidics, Fluidic amplifiers, Power amplifiers, Pulse, Power supplies, Velocity, Jets, Valves, Control systems.

The Systems and Controls Laboratory encourages graduate research and development on engineering systems, with emphasis on bridging the gap between theory and practice. Much of the work involves mathematical and computer modeling and analysis. A major part of this work devoted to advanced engineering in aerospace systems.

AD-776 437/6GA Reprint
Cornell Univ Ithaca N Y Dept of Theoretical and Applied Mechanics
SHEAR FLOW PAST A FLAT PLATE,
V. O. S. Olunloyo. 5 Sep 72, 21p AROD-5329.49-M Grants DA-ARO-D-31-124-71-G163, NSF-GP-28483
Availability: Pub. in Jnl. of Engineering Mathematics, v7 n4 p327-345 Oct 73.

Descriptors: *Boundary layer flow, *Flat plate models, *Kinetic theory, Pressure gradients, Shear properties, Walls, Inviscid flow, Mathematical models, Reviews, Flow fields.
Identifiers: Controversies, *Shear flow.

A controversy over the induced pressure gradient in shear flow is re-examined in the context of general bounding. It is shown that the results reported in two earlier papers are typical near the leading edge, but far downstream they are only valid in the presence of walls. In particular two new effects arise: for weak bounding, logarithmic terms appear in the inviscid pressure, and a resonance with the first eigensolution occurs. For the symmetric case particular result is recovered. (Modified author abstract)

AD-776 442/6GA Reprint
California Inst of Tech Pasadena Dept of Applied Mathematics
SINGULAR PERTURBATION OF NONLINEAR TWO-POINT BOUNDARY-VALUE PROBLEMS,
Donald S. Cohen. 1973, 12p AROD-7625.29-M
Contract DAHC04-68-C-0006, Grant NSF-GP-18471

Descriptors: *Gas dynamics, *Boundary value problems, Nonlinear differential equations, Theorems.
Identifiers: *Two point boundary value problems.

The paper was motivated by certain nonlinear boundary-value problems which occur in fluid and gas dynamics. The author discusses them and some mathematical generalizations of them here. Specifically, the author is concerned with establishing the existence and asymptotic behavior for small epsilon > 0 of the solution of the nonlinear two-point boundary-value problem: epsilon u3 + f(x,u,u')u' = 0, 0<x<1 u'(0)-au(0) = A > or = 0, (a>0) u'(1) + bu(1) = B>0, (b>0). (Author)

AD-776 476/4GA Reprint
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
A SURVEY OF THE MEAN TURBULENT FIELD CLOSURE MODELS,
George L. Mellor, and H. James Herring. 8 Dec 72, 12p AFOSR-TR-74-0318
Contract AF-AFOSR-1828-70
Revision of report dated 22 Mar 71.
Availability: Pub. in AIAA Jnl., v11 n5 p590-599 May 73.

Descriptors: *Turbulent flow, Partial differential equations, Reynolds number, Numerical analysis, Computer applications.

The simple mixing length or eddy viscosity or Mean Velocity Field models were successful and are now useful engineering tools. Mean Turbulent Field models are currently in the forefront of research although, in the main, the basic theories of hypotheses that comprise the models are not new. In the present article the authors have tried to sort out two forms of MTF models: the simple MTE model consisting of the differential turbulent energy equation and an algebraic shear stress equation; and the more complicated MRS model which requires the solution of a differential equation for each component of the Reynolds stress tensor. The authors have tried to show how the MTE model logically derives from the MRS model and that both involve essentially the same empirical information, all of which is defined in terms of length scales.

AD-776 494/7GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
MEASUREMENT OF THE MEAN PERIOD BETWEEN BURSTS,
S. S. Lu. 27 Jun 73, 2p
Revision of report dated 20 Mar 73. Prepared in cooperation with National Tsing-Hua Univ., Hsinchu (Taiwan). Sponsored in part by Office of Naval Research, Arlington, Va., and National Science Foundation, Washington, D.C.
Availability: Pub. in the Physics of Fluids, v16 n11 p2012-2013 Nov 73.

Descriptors: *Turbulent boundary layer, *Fluid dynamics, *Transients, Periodic variations, Time, Measurement, Flow visualization, Mathematical models, High pass filters.
Identifiers: *Turbulent bursts.

The effect of a high pass filter on the measurements of the mean period between bursts in a turbulent boundary layer is studied. The second mild maximum of the autocorrelation curve of the fluctuating streamwise velocity is not necessarily produced by bursting.

AD-776 559/7GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ADIABATIC SURFACE TEMPERATURE IN A VORTEX BOUNDARY LAYER,
M. G. Morozov. 3 Dec 74, 8p Rept no. FSTC-HT-23-2077-72
Trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v20 p903-908 May 71.

Descriptors: *Turbulent boundary layer, *Supersonic characteristics, *Temperature, *Vortices, Surface properties, Reduction, Adiabatic conditions, Notch sensitivity, Flat plate models, Translations, USSR.
Identifiers: *Temperature reduction.

Calculation of temperature reduction of the adiabatic surface in a supersonic, turbulent boundary layer was carried out. It was shown that the temperature reduction is a consequence of the appearance of a chain of vortices in the boundary flow. Comparison of calculated and experimental data gives qualitative agreement.

AD-776 586/0GA PC$5.00/MF$1.45
Naval Ordnance Lab White Oak Md
HANDBOOK OF BLUNT-BODY AERODYNAMICS. VOLUME 1.
Technical rept.,
John A. Darling. 1 Dec 73, 154p Rept no. NOLTR-73-225

Descriptors: *Blunt bodies, *Aerodynamic characteristics, *Handbooks, Static stability, Force(Mechanics), Pressure, Subsonic characteristics, Equations of motion, Problem solving.
Identifiers: Normal force.

The report describes methods for quickly estimating the normal force and center of pressure of blunt free-fall shapes of l/d = 0.5 to 10 over a Mach number range of 0.4 to 2.5 and up to alpha = 90 degrees. Charts and equations presented in the report are from cited reference material and original sources. Methods based on slender-body theory tested on blunt shapes and modifying factors were developed where needed. (Author)

AD-776 613/2GA PC$3.25/MF$1.45
Purdue Univ Lafayette Ind Project Squid Headquarters
FURTHER APPLICATIONS OF HOT-WIRE ANEMOMETRY TO TURBULENCE MEASUREMENTS IN HELIUM-AIR MIXTURES.
Technical rept.,
Richard A. Stanford, and Paul A. Libby. Jan 74, 45p Rept no. SQUID-TR-UCSD-5-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with California Univ., San Diego, La Jolla.

Descriptors: *Anemometers, *Hot wire, *Turbulent flow, Helium, Mixtures, Air, Probes, Velocity, Measurement, Flow fields, Deflection, Sensitivity, Probability density functions, Concentration(Composition).
Identifiers: *Hot wire anemometry, Helium air mixtures.

The extension of the Way-Libby probe to permit the measurement of two velocity components, u and v, in the usual notation, and the mass fraction, c, of helium in turbulent flows involving helium-air mixtures is described. The accuracy of the technique, especially the sensitivity to flow deflection is carefully assessed. Results obtained in applying the new probe show, inter alia, highly skewed probability density functions of helium concentration in an internal flow. (Author)

AD-776 639/7GA PC$5.00/MF$1.45
Douglas Aircraft Co Long Beach Calif
EXTENSION OF THE DOUGLAS-NEUMANN PROGRAM FOR AXISYMMETRIC BODIES TO INCLUDE CALCULATIONS OF POTENTIAL, NON-UNIFORM CROSS FLOW, ADDED MASS AND CONDUCTOR PROBLEMS,
John L. Hess. 1 Sep 64, 37p Rept no. DAC-31765
Contract N60530-10053

Descriptors: *Bodies of revolution, *Flow fields, Axially symmetric flow, Cross flow, Fluid dynamics, Mathematical models, Problem solving, Equations of motion, Ellipsoids, Graphics, Numerical integration, Electrostatics, Nonuniform flow, Electric conductors.
Identifiers: Potential flow.

The report describes certain extensions to some methods described in the references for computing potential flow about bodies of revolution. For the fluid dynamics problem the principal extensions were: (1) adding the capability of computing the perturbation part of the velocity potential for both axisymmetric flow and cross flow at any point either on or off the body surface; and (2) adding the capability of computing the flow about a body immersed in an onset flow that is not a uniform stream for both axisymmetric flow and cross flow. (Modified author abstract)

AD-776 681/9GA Reprint
Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)
IMPROVEMENT TO KLINEBERG'S METHOD FOR THE CALCULATION OF VISCOUS-INVISCID INTERACTIONS IN SUPERSONIC FLOW,
Bernard G. Gautier, and Jean J. Ginoux. 2 Nov 72, 5p EOARD-TR-74-4
Grant AF-AFOSR-2469-73
Availability: Pub. in AIAA Jnl., v11 n9 p1323-1326 Sep 73.

Descriptors: *Walls, *Cooling, *Hypersonic characteristics, *Laminar boundary layer, *Shock waves, Interactions, Mathematical models, Model tests, Flat plate models, Translations, France, Mathematical prediction, Heat transfer, Two dimensional flow, Viscous flow, Distribution.

The report describes a theoretical and experimental investigation of the effect of wall cooling on the overall features of shock wave-laminar boundary layer interactions in hypersonic two-dimensional flow. The integral method of Lees-Reeves-Klineberg was modified in order to compute viscous interactions over a continuous range of wall-to-stagnation temperature ratios using a single set of integral functions. Comparisons between the theoretical predictions and the experimental results obtained from pressure and heat transfer distribution measurements show satisfactory agreements. The experiments were carried out using flat plate-wedge models for different wall cooling rates. (Modified author abstract)

AD-776 715/5GA Reprint
Delaware Univ Newark Dept of Chemical Engineering
TURBULENT DRAG REDUCTION IN POLYMERIC SOLUTIONS CONTAINING SUSPENDED FIBERS.
Technical rept.,
W. K. Lee, R. C. Vaseleski, and A. B. Metzner. 26 Sep 73, 10p
Contract N00014-70-A-0113-0001
Revision of report dated 9 Aug 73.
Availability: Pub. in AIChE Jnl., v20 n1 p128-133 Jan 74.

Descriptors: *Drag reduction, *Polymers, *Solutions(Mixtures), *Dispersions, *Asbestos, *Fibers, Turbulent flow, Test methods, Additives, Tubes, Test equipment, Friction.
Identifiers: *Drag reducing fluids.

Both polymeric solutions and fiber suspensions have separately been known to exhibit drag reduction under turbulent flow conditions. It has recently been shown that the mechanisms of drag reduction differ appreciably in these two kinds of systems. The objective of this study was to show that both mechanisms may be exploited concomitantly to achieve unusually low friction factors. Drag reductions in excess of 95% have been obtained in a 2.4-cm tube and there is no evidence that even more dramatic results could not be obtained under optimal conditions. (Author)

AD-776 720/5GA Reprint
New York Univ N Y
NONLINEAR RESONANT OSCILLATIONS IN OPEN TUBES,
Brian R. Seymour, and Michael P. Mortell. 25 Nov 72, 17p ARO-D-5669.26-M
Grant DA-ARO-D-31-124-72-G47
Availability: Pub. in Jnl. of Fluid Mechanics, v60 p44 p733-749 1973.

Descriptors: *Gas flow, Gas cylinders, Resonant frequency, Damping, Nonlinear differential equations, Functional analysis.
Identifiers: *Acoustic resonance.

A gas in a tube, one end of which is open, is driven by a periodic applied velocity or pressure at or near a resonant frequency. Damping is introduced into the system by radiation of energy through the open end. It is shown that shocks are possible at an open end and that there is a critical level of damping which ensures a continuous gas response for all frequencies. At the critical level the amplitude of the response is O(epsilon sup 1/3), where epsilon is the amplitude of the input, and it is bounded by the amplitude predicted by linear theory. There is agreement with the qualitative experimental results available. (Author)

AD-776 735/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE EJECTION CAPACITY OF MIXERS WHICH PARTIALLY LIMIT THE JET AND THE FLAME,
V. G. Lisienko, V. V. Bondarenko, G. V. Voronov, B. I. Kitaev, and N. I. Kokarev. 8 Mar 74, 9p Rept no. FTD-HT-23-870-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p56-59 1972, by Charles T. Ostertag, Jr.

Descriptors: *Ejectors, Diffusers, Jet mixing flow, Jets, Translations, USSR.

AD-776 772/6GA PC$3.75/MF$1.45
Dayton Univ Ohio Research Inst
ERROR BOUNDS FOR LAMINAR BOUNDARY LAYER SOLUTIONS.
Final rept. 1 Dec 71-30 Nov 73,
Jack G. Crouch. Dec 73, 55p ARL-73-0193
Contract F33615-72-C-1412

Descriptors: *Laminar boundary layer, *Two dimensional flow, Prandtl number, Differential equations, Theorems.

The research is concerned with determining error bounds for approximate solutions of the Prandtl boundary layer equations. The error bounds are determined by applying the theory of differential inequalities. The approximate solutions are of the weighted-residual type and the boundary layer cases studied include both similar and nonsimilar, two-dimensional laminar, incompressible, steady flows. (Modified author abstract)

AD-776 820/3GA PC$4.00/MF$1.45
Air Force Armament Lab., Elgin AFB, Fla.
INSTRUMENTATION CONSIDERATIONS FOR THE EXTRACTION OF AERODYNAMIC COEFFICIENTS FROM FREE FLIGHT DATA.
Final rept. May-Dec 73,
Gerald Solomon. Jan 74, 92p AFATL-TR-74-29

Descriptors: *Aerodynamic characteristics, *Errors, *Instrumentation, *Free flight, Coefficients, Accuracy, Cost effectiveness, Guidance, Control, Equations of motion, Least squares method, Estimates, Scaling factors, Theses.
Identifiers: *Aerodynamic coefficients, *Error analysis.

An error analysis method developed from weighted nonlinear least squares estimation techniques is applied to the extraction of aerodynamic coefficients from free flight data. The error analysis method developed may be used to assess the effects of instrumentation errors on the estimates of the extracted aerodynamic coefficients. The weighting matrix utilized is the inverse of the measurement error covariance matrix. The matrix of sensitivity coefficients used in the estimation process is shown to be functionally dependent upon the quantities measured. A method is developed whereby a single set of parametric differential equations may be used in determining the sensitivity matrix, regardless of the instrumentation arrangement. Six degrees of freedom equations of motion, the theory of simple motion measuring devices, and some aspects of least squares estimation are reviewed. (Author)

AD-776 840/1GA Reprint
California Univ Berkeley Dept of Mechanical Engineering
PRESSURE DISTRIBUTION AND VELOCITY PROFILES IN SUPERSONIC LAMINAR WAKES,
M. Holt, and J. C. S. Meng. 6 Nov 72, 10p AFOSR-TR-74-0384
Grant AF-AFOSR-2318-72
Presented at the International Astronautical Congress (22nd), Brussels, Belgium, Sep 71. Abstracts in French and German.
Availability: Pub. in Astronautica Acta, v18 n2 p91-98 1973.

Descriptors: *Wake, *Supersonic characteristics, *Laminar flow, *Wedges, Base flow, Pressure, Distribution, Velocity, Profiles, Mathematical models, Hypersonic characteristics, Flow separation.
Identifiers: Method of integral relations, Flow reattachment.

The method of integral relations is applied to calculate the characteristics of laminar wakes in supersonic flow past a wedge with a flat base. An earlier analysis of the flow in the critical recompression region is extended so that the flow near the base can be determined. Results are worked out for flow past a wedge of 10 deg. semiangle at Mach number 6 and two values of Reynolds number. The pressure distribution along the axis is calculated, together with velocity profiles at various stations and streamline patterns in the recirculation region. Good agreement with experiment is found. (Author)

AD-776 841/9GA Reprint
Stanford Univ Calif Dept of Aeronautics and Astronautics
NONLINEAR RESONANT WAVE MOTION OF A RADIATING GAS,
James E. Eninger, and Walter G. Vincenti. 6 Mar 73, 29p AFOSR-TR-74-0404
Contract F44620-69-C-0006
Availability: Pub. in Jnl. of Fluid Mechanics, v60 pt1 p161-186 1973.

Descriptors: *Gas dynamics, *Radiative transfer, Wave equations, Resonant frequency, Shock waves.
Identifiers: *Acoustic resonance.

The paper studies the interaction of gasdynamic wave motion and the radiative transfer of energy.

AD-776 848/4GA Reprint
Stanford Univ Calif Dept of Aeronautics and Astronautics
THEORY FOR RADIATIVELY DRIVEN HARMONIC ACOUSTIC WAVES IN A CONFINED GAS,
Gary T. Chapman, Dale L. Compton, and Walter G. Vincenti. 13 Mar 73, 15p AFOSR-TR-74-0403
Contract F44620-69-C-0006
Revision of report dated 1 Aug 72.
Availability: Pub. in the Physics of Fluids, v16 n8 p1220-1231 Aug 73.

Descriptors: *Gas dynamics, *Radiative transfer, *Acoustic waves, Partial differential equations, Theorems.

A detailed theoretical study is made of radiatively driven acoustic waves inside a closed cylindrical tube. The formulation accounts for all the essential phenomena for a gas in vibrational equilibrium--namely, gas motion, longitudinal and radial viscous dissipation, longitudinal and radial heat conduction, and radiative transfer with spectral detail included. An approximate expression is derived for the pressure response. This solution is applicable to arbitrary spectral distribution of the radiative absorption coefficient, under conditions attainable in the laboratory. The solution includes both tuned and untuned acoustic conditions as well as the spectrophone limit--that is, the condition where the length of the tube is much smaller than the length of the acoustic wave. The influence of spectral detail on the pressure response is illustrated by an example that employs a single Lorentz profile to represent an absorption band. (Author)

AD-776 872/4GA Reprint
California Univ Berkeley Dept of Mechanical Engineering
FIRST-ORDER FREQUENCY EFFECTS IN SUPERSONIC PANEL FLUTTER OF FINITE CYLINDRICAL SHELLS,
M. Holt, and T. M. Lee. Sep 71, 10p AFOSR-TR-74-0409
Grant AF-AFOSR-2318-72
Availability: Pub. in Transactions of the ASME, Jnl. of Applied Mechanics, p464-470 Jun 73. (Paper 73-APM-K).

Descriptors: *Flutter, *Shells(Structural forms), *Cylindrical bodies, *Supersonic characteristics, Excitation, Oscillation, Aerodynamic loading, Mathematical models, Equations of motion, Frequency, Problem solving.

An improved calculation of the supersonic panel flutter characteristics of a thin cylindrical shell of finite length is presented. The aerodynamic load is determined with account taken of first-order terms in vibration frequency, and when this is introduced into the elastic shell equation an integro differential equation results. An equivalent eigenvalue problem is set up by applying Galerkin's method to this equation. (Modified author abstract)

FEI-380 PC$3.50/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
HEAT-EXCHANGE DURING TURBULENT FLOW OF VARIOUS COOLANTS IN THE RING GAPS.
V. P. Bobkov, M. Kh. Ibragimov, and N. K. Savanin. 1972, 30p
In Russian. U.S. Sales Only.

Descriptors: (*Turbulent flow, *Heat transfer), Prandtl number.

For abstract, see NSA 29 07, number 15490.

FEI-391 PC$3.75/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
CALCULATIONS OF THE VELOCITY AND PRESSURE FIELDS IN A FLAT DISTRIBUTING COLLECTOR.
E. V. Nomofilov, T. M. Romanova, and V. T. Filimonov. 1973, 35p
In Russian. U.S. Sales Only.

Descriptors: Fluid flow, Navier-stokes equation, Pressure gradients, Reynolds number, Velocity.

For abstract, see NSA 29 07, number 15491.

N74-16699/2GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
BOUNDARY CONDITION PROGRAM FOR AERODYNAMIC LIFTING SURFACE THEORY.
R. T. Medan, and K. S. Ray. Nov 73, 67p NASA-TM-X-62323

Descriptors: *Fortran, *Lifting bodies, *User manuals (Computer programs), Aerodynamic characteristics, Boundary layers.

For abstract, see STAR 1208

N74-16700/8GA PC$7.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
EQUATION SOLVING PROGRAM FOR AERODYNAMIC LIFTING SURFACE THEORY.
R. T. Medan, and O. J. Lemmer. Jan 74, 91p NASA-TM-X-62325

Descriptors: *Aerodynamic characteristics, *Kernel functions, *Subsonic flow, *User manuals (Computer programs), *Wings, Aerodynamic coefficients, Computer programs, Fortran, Numerical analysis.

For abstract, see STAR 1208

N74-16701/6GA PC$6.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
INFLUENCE MATRIX PROGRAM FOR AERODYNAMIC LIFTING SURFACE THEORY.
R. T. Medan, and K. S. Ray. Dec 73, 62p NASA-TM-X-62324

Descriptors: *Lifting bodies, *Subsonic flow, *User manuals (Computer programs), Fortran, Kernel functions, Thin wings, Trailing edges.

For abstract, see STAR 1208

N74-16703/2GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A RAPID NUMERICAL SOLUTION TO SUBSONIC FLOW OVER PLANAR AND AXISYMMETRIC PROFILES AT AN ANGLE OF ATTACK OF 0 DEG.
V. R. Mascitti. Mar 74, 33p NASA-TN-D-7410, L-8904

Descriptors: *Finite difference theory, *Flow equations, *Incompressible flow, *Subsonic flow, Angle of attack, Cdc 6600 computer, Computer programs, Numerical analysis, Two dimensional flow.

For abstract, see STAR 1208

N74-16704/0GA PC$4.00/MF$1.45
Wisconsin Univ., Milwaukee.
NUMERICAL CALCULATIONS OF VELOCITY AND PRESSURE DISTRIBUTION AROUND OSCILLATING AIRFOILS.
T. Bratanow, A. Ecer, and M. Kobiske. Feb 74, 86p NASA-CR-2368
Contract NGR-50-007-001

Descriptors: *Aerodynamic characteristics, *Airfoils, *Oscillating flow, *Pressure distribu-

tion, Air flow, Finite element method, Navier-stokes equation, Numerical analysis.

For abstract, see STAR 1208

N74-16705/7GA PC$9.00/MF$1.45
Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).
COLLECTION OF EXPERIMENTAL DATA FOR AIRCRAFT AFTERBODY DRAG IN THE TRANSONIC AND SUPERSONIC RANGE AND COMPARISON WITH THEORETICAL CALCULATION METHODS ZUSAMMENSTELLUNG EXPERIMENTELLER UNTERLAGEN ZUM HECKWIDERSTAND VON FLUGKOERPERN IM TRANSSCHALL- UND IM UEBERSCHALLBEREICH UND VERGLEICH MIT THEORETISCHEN BERECHNUNGSMETHODEN.
W. R. Schmidt, and E. Herpfer. Apr 73, 118p BMVG-FBWT-73-27
Subm-Sponsored by Bundesmin. Fuer Verteidigung.
In German; English Summary.

Descriptors: *Aerodynamic characteristics, *Afterbodies, *Drag, *Flow characteristics, *Supersonic jet flow, Graphs (Charts), Nozzle flow, Supersonic speeds, Three dimensional flow, Two dimensional flow.

For abstract, see STAR 1208

N74-16707/3GA PC$5.00/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).
CALCULATION OF THE DISPLACEMENT EFFECT IN TWO-DIMENSIONAL SUBSONIC ATTACHED FLOW AROUND AEROFOILS. EXAMPLES OF CALCULATIONS USING MEASURED DISPLACEMENT THICKNESSES.
W. J. Piers, and J. W. Slooff. 8 May 72, 40p NLR-TR-72116-U
Subm-Sponsored by the Directorate of Materiel Air, Roy. Neth. Air Force.

Descriptors: *Airfoils, *Reattached flow, *Subsonic flow, *Two dimensional flow, Flow characteristics, Lift, Pressure distribution.

For abstract, see STAR 1208

N74-16708/1GA PC$12.00/MF$1.45
Technische Hogeschool, Delft (Netherlands). Dept. of Aeronautical Engineering.
QUASI HOMOGENEOUS APPROXIMATIONS FOR THE CALCULATION OF WINGS WITH CURVED SUBSONIC LEADING EDGES FLYING AT SUPERSONIC SPEEDS.
Ph. D. Thesis.
R. Coene. Feb 73, 180p VTH-173

Descriptors: *Approximation, *Arrow wings, *Leading edges, *Supersonic speeds, Boundary value problems, Curvature, Flow theory, Subsonic flow.

For abstract, see STAR 1208

N74-17012/7GA PC$8.50/MF$1.45
Queens Univ., Kingston (Ontario). Dept. of Mechanical Engineering.
RESPONSE FUNCTIONS FOR PITOT PROBES IN TURBULENT STREAMS.
H. A. Becker, and A. P. G. Brown. May 72, 130p REPT-2-72
Subm-Sponsored by Natl. Res. Council of Canada.

Descriptors: *Air flow, *Flow measurement, *Pitot tubes, *Turbulent flow, *Velocity measurement, Data processing, Flow characteristics, Numerical analysis, Tables (Data).

For abstract, see STAR 1208

N74-17013/5GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
THE COMPUTATION OF STEADY NOZZLE FLOW BY A TIME-DEPENDENT METHOD.
M. C. Cline. Apr 74, 20p NASA-TM-X-71918
Subm-Backup Document for Aiaa Synoptic Scheduled for Publication in Aiaa Journal in Apr. 1974.

Descriptors: *Flow coefficients, *Flow geometry, *Nozzle flow, *Steady flow, *Two dimensional flow, Cdc 6600 computer, Conical flow, Finite difference theory, Flow equations.

For abstract, see STAR 1208

N74-17015/0GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER PROGRAM FOR QUASI-ONE-DIMENSIONAL COMPRESSIBLE FLOW WITH AREA CHANGE AND FRICTION - APPLICATION TO GAS FILM SEALS.
J. Zuk, and P. J. Smith. Feb 74, 86p NASA-TN-D-7481, E-7241

Descriptors: *Compressible flow, *Computer programs, *Flow resistance, *Gas flow, *Seals (Stoppers), Chokes (Fuel systems), Friction, Laminar flow, Turbulent flow.

For abstract, see STAR 1208

N74-17016/8GA PC$4.50/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio.
ANALYSIS OF LAMINAR FLOW BETWEEN STATIONARY AND ROTATING DISKS WITH INFLOW.
Final Report.
U. Rohatgi, and E. Reshotko. Feb 74, 119p NASA-CR-2356, FTAS/TR-73-85
Contract NGL-36-003-139

Descriptors: *Laminar flow, *Rotating disks, Differential equations, Prandtl number, Pressure distribution, Temperature distribution.

For abstract, see STAR 1208

N74-17019/2GA PC$5.25/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
WALL BOUNDARY EQUATIONS WITH SLIP AND CATALYSIS FOR MULTICOMPONENT, NONEQUILIBRIUM GAS FLOWS.
C. D. Scott. Dec 73, 43p NASA-TM-X-58111, JSC-08558

Descriptors: *Flow equations, *Gas flow, *Gas-solid interfaces, *Nonequilibrium flow, Distribution functions, Numerical analysis, Particle diffusion.

For abstract, see STAR 1208

N74-17020/0GA PC$7.75/MF$1.45
Remtech, Inc., Huntsville, Ala.
THREE DIMENSIONAL LASER DOPPLER VELOCIMETER TURBULENCE MEASUREMENTS IN A PIPE FLOW.
C. E. Fuller, Iii, W. C. Cliff, and R. M. Huffaker. Apr 73, 95p NASA-CR-129017, RTR-002-2
Contract NAS8-25896

Descriptors: *Laser doppler velocimeters, *Pipe flow, *Turbulence, Electronic equipment, Frequency ranges, Hot-wire anemometers, Scattering functions, Test facilities.

For abstract, see STAR 1208

N74-17021/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NUMERICAL CALCULATIONS OF TWO DIMENSIONAL, UNSTEADY TRANSONIC FLOWS WITH CIRCULATION.
R. M. Beam, and R. F. Warming. Feb 74, 29p NASA-TN-D-7605, A-5265

Descriptors: *Aerodynamic coefficients, *Transonic flow, *Transonic flutter, *Unsteady flow, Finite difference theory, Numerical analysis, Transonic flow, Transonic wind tunnels.

For abstract, see STAR 1208

N74-17022/6GA PC$4.00/MF$1.45
Nielsen Engineering and Research, Inc., Mountain View, Calif.
SURFACE PRESSURE FLUCTUATIONS IN HYPERSONIC TURBULENT BOUNDARY LAYERS.
Final Report.
K. R. Raman. Feb 74, 92p NASA-CR-2386
Contract NAS2-6838

Descriptors: *Flat plates, *Piezoelectric transducers, *Pressure oscillations, *Turbulent boundary layer, Flat surfaces, Hypersonic flow, Pressure distribution, Shear stress, Wall flow.

For abstract, see STAR 1208

N74-17025/9GA PC$5.00/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
TURBULENCE WITH SOLID BODIES TURBULENZ MIT FESTEN KOERPERN.
H. Reichardt. Jun 73, 36p REPT-7/1973
In German; English Summary.

Descriptors: *Cylindrical bodies, *Flow characteristics, *Solid surfaces, *Turbulent flow, Flow distribution, Flow visualization, Impulses, Jet flow, Photographs, Turbulent jets, Velocity measurement, Water.

For abstract, see STAR 1208

PB-229 772/9GA PC$4.00/MF$1.45
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
OBSERVATION AND MEASUREMENT OF CAVITATION NUCLEI USING COULTER COUNTER AND LASER LIGHT SCATTERING IN CAVITATION AND MULTIPHASE FLOW LAB. AT UNIVERSITY OF MICHIGAN.
Technical rept.,
F. G. Hammitt, A. Keller, O. Ahmed, and J. J. Pyun. Feb 74, 6p UMICH-01357-24-I
Grant NSF-GK-1889

Descriptors: *Water, *Gas analysis, Cavitation, Bubbles, Concentration(Composition), Spectral determination, Sodium, Liquid metal cooled reactors.
Identifiers: Coulter counters, Cavitation nuclei.

The laboratory has been engaged for several years in the development of techniques for the measurement of entrained gas nuclei spectra in water, and the correlation of these results with measured cavitation thresholds. This work has been done both in a tunnel facility using a venturi as the cavitation component with a modified Coulter Counter device for nuclei counting, and also in a quasi-static system in which cavitation is induced by a relatively standard cavitation-damage vibrating horn. In a more recent study, the nuclei spectra have been measured by both Coulter Counter and laser-light scattering devices, and direct comparison between these methods obtained with the same water sample at the same location. (Modified author abstract)

PB-230 192/7GA PC$4.75/MF$1.45
Council for Scientific and Industrial Research, Pretoria (South Africa). Chemical Engineering Research Group.

AN ANALYSIS OF PARTICLE DISTRIBUTION IN A HYDROCYCLONE.
D. I. Exall. Nov 73, 31p ISBN-0-7988-0453-X, CSIR-SR-CENG-018

Descriptors: *Hydrocyclones, *Separators, *Water injection, *Flow control, *Particles, Particle size distribution, Turbulent flow, Revisions, Components, Design improvements, Efficiency, South Africa.

If water is injected tangentially on the circumference of a cylindrical hydrocyclone, the turbulence and radial component of velocity may be modified, leading to a control of the radial distribution according to particle size and hence on the classification obtained. The analysis is based on a simplified theoretical model of the behaviour of the solid particles in such a velocity field. An improvement in the separation obtained in a hydrocyclone might be expected even without water injection by replacing the conventional cylindrical-conical design by a more effective configuration.

PB-230 645/4GA PC$4.50/MF$1.45
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
VALVE AND ORIFICE CAVITATION INCEPTION SIGMA SCALE EFFECTS,
F. G. Hammitt. Mar 74, 27p UMICH-01357-25-1
Grant NSF-GK-1889
Sponsored in part by Argonne National Lab., Ill.

Descriptors: *Cavitation, *Orifices, *Valves, Hydrofoils, Venturi tubes, Scale, Hydrodynamics, Sizes(Dimensions), Pressure, Velocity.

Three cavitation sigma parameters, common for various types of flow devices, are compared, particularly for the purpose of converting the sigma form often utilized for valves and orifices into forms conventionally used for hydrofoils (and other forms of submerged objects) and venturis. Conversion relations between these sigma are derived. Using empirical results for valves and orifices, substantial scale effects in terms of that form of sigma appropriate for valves are shown in terms of size, pressure, and velocity changes.

20E. Masers and Lasers

AD-776 337/8GA PC$3.00/MF$1.45
National Bureau of Standards Washington D C Inst for Materials Research
LASER DAMAGE IN MATERIALS.
Final technical rept. 1 Jan 72-31 Dec 73,
Albert Feldman, Deane Horowitz, and Roy M. Waxler. Mar 74, 17p Rept no. NBSIR-74-458
ARPA Order-2016

Descriptors: *Laser materials, *Radiation effects, Optical glass, Silica glass, Yttrium aluminum garnet, Lithium compounds, Niobates, Calcite, Potassium compounds, Phosphates, Deuterium compounds, Yttrium oxides, Thorium, Neodymium lasers, Focusing, Electrostriction, Electrooptics, Polarization, Solid state lasers, Q switched lasers.
Identifiers: Lithium niobates, Potassium dihydrogen phosphate, Self focusing.

The report summarizes the study of damage and self-focusing in materials used in Q-switch solid-state laser systems. In borosilicate crown glass, fused silica, dense flint glass, and yttrium aluminum garnet, self-focusing appears to be the main cause of damage. An analysis of damage threshold measurements with linearly polarized radiation and circularly polarized radiation suggests that the Kerr effect is the dominant self-focusing mechanism with a significant contribution to self-focusing from the thermal effect. The electrostrictive effect is negligible. The damage threshold in Nd:doped laser glasses appears to be intrinsic. In all the above materials, the damage threshold for circular polarization is greater than the damage threshold for linear polarization. In lithium niobate, calcite, potassium dihydrogen phosphate, and deuterated dihydrogen phosphate, damage at the lowest levels is caused by inclusions. Bulk and surface damage thresholds in nd:doped thoria:yttrium oxide ceramic are obtained relative to bulk damage thresholds in several optical materials. Relationships under different geometric boundary conditions are also derived for solid materials between the stress-optic coefficients and the electrostrictive coefficients. (Author)

AD-776 426/9GA Reprint
IBM Thomas J Watson Research Center Yorktown Heights N Y
ALUMINUM MIRROR DEGRADATION IN A VUV LASER,
R. W. Dreyfus, R. J. von Gutfeld, and S. C. Wallace. 8 Oct 73, 6p AROD-10437.7-P
Contracts DAHC04-72-C-0017, N00014-73-C-0072
Report on Vacuum ultraviolet (vuv) laser.
Availability: Pub. in Optics Communications, v9 n4 p342-345 Dec 73.

Descriptors: *Ultraviolet lasers, *Mirrors, Aluminum, Ultraviolet optical materials, Laser materials, Thermal degradation.

Thermal calculations have been made for overcoated aluminum mirror structures of the type used in vacuum uv lasers. The resulting thermal profiles suggest the dominant mechanism for mirror failure to be melting of the aluminum. Design parameters to avoid rapid mirror degradation are discussed. (Author)

AD-776 505/0GA Reprint
City Coll New York Dept of Physics
EFFICIENT CALCULATION OF CORRELATION FUNCTIONS FOR A FOKKER-PLANCK SYSTEM.
Technical rept.,
Wallace Arden Smith. Jan 74, 7p Rept no. TR-11
AROD-10611.11-P
Grant DA-ARO-D-31-124-73-G5
Availability: Pub. in Physical Review Letters, v32 n1 p1-4, 7 Jan 74.

Descriptors: *Lasers, *Equations of motion, *Partial differential equations, Correlation techniques, Approximation.
Identifiers: Fokker-Planck equation.

A method is described for the efficient calculation of temporal correlations in systems whose equation of motion is a Fokker-Planck equation. The speed and accuracy of this approach is illustrated by a calculation of the intensity fluctuation and amplitude-phase correlation functions for a single-mode laser near threshold. (Author)

AD-776 541/5GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
ELECTROMAGNETIC FIELD IN A LASER RESONATOR.
Interim rept. Sep 72-Sep 73,
William H. Carter. 11 Mar 74, 38p Rept no. NRL-7663

Descriptors: *Lasers, *Resonators, Electromagnetic fields, Mathematical models.

A new theory has been formulated whereby the electromagnetic field inside resonator filled with an active medium is described through an expansion of the field into an angular spectrum of plane waves. The resonator is composed of two identical, circular reflectors of arbitrary size, focal length, and axial separation and contains an isotropic, homogeneous, saturable amplifying medium. This theory properly accounts for the vector properties of the field, is not limited by the usual paraxial approximations, and provides integral expressions for the spatial distribution of the field over the interior of the resonator in three dimensions. The expression for the transverse electric component of the field was evaluated numerically for several of the lower loss modes in confocal, spherical, and unstable resonators with linear dimensions the order of 10 wavelengths. These data indicate that some of the modes in confocal and spherical resonators are unstable, if the resonator has dimensions of a few wavelengths. The effect on the spatial distribution of the resonator field due to saturation of the amplifying medium is slight if spatial hole burning is neglected. The electromagnetic field given by this theory was also quantized, and the resulting formulation resembles the quantum theory for radiation in a closed resonator. (Author)

AD-776 564/7GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
FREQUENCY STABILIZATION OF A RING LASER,
N. G. Basov, E. M. Belenov, M. I. Volnov, M. A. Gubin, and V. V. Nikitin. 7 Nov 73, 5p Rept no. FSTC-HT-23-300-73
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki. Pisma v Redaktsiyu (USSR) v15 n11 p659-661 1972, by John T. Eros.

Descriptors: *Ring lasers, *Frequency stabilizers, Frequency standards, Translations, USSR.
Identifiers: Helium neon lasers.

Results are given of a experiment in creating the optical (lambda = 3.39 microns) standard of a frequency with a relative frequency stability of delta nu/nu = 5 x 10 to the minus 14th power.

AD-776 597/7GA PC$3.25/MF$1.45
Hughes Research Labs Malibu Calif
PLASMA CATHODE FOR E-BEAM LASERS.
Semiannual technical rept. 1 Jun-31 Dec 73,
John R. Bayless. Mar 74, 44p
Contract N00014-72-C-0496, ARPA Order-1807
See also report dated Jul 73, AD-764 079.

Descriptors: *Gas lasers, *Electron guns, *Cathodes, Plasma medium, Excitation, Electron irradiation, Electron beams, Electric discharges, Experimental design.

The objective of this program is to develop a new type of plasma cathode electron gun and to demonstrate that it has properties suitable for operation with E-beam lasers. This device employs a plasma generated within a low-voltage hollow cathode discharge rather than a thermionic emitter as the source of electrons. Electrons extracted from the plasma pass through a triode-type control grid structure and are accelerated to high energies in a plasma-free region prior to emerging from the gun through a thin foil window. The device is characterized by ruggedness, low cost, low power consumption, and fast response in comparison to thermionic cathode E-guns. (Modified author abstract)

AD-776 663/7GA PC$3.75/MF$1.45
United Aircraft Research Labs East Hartford Conn
MICROWAVE MODULATION OF CO2 LASERS IN GAAS THIN FILM OPTICAL WAVEGUIDES.
Semi-annual technical rept. no. 3, 25 Sep 73-25 Mar 74,
P. K. Cheo, M. Gilden, D. Fradin, and R. Wagner. 29 Mar 74, 64p Rept no. UARL-N921513-6
Contract N00014-73-C-0087, ARPA Order-1860

Descriptors: *Carbon dioxide lasers, *Laser modulators, Thin films, Gallium arsenides, Infrared lasers, Gas lasers, Waveguides, Phase modulation, Sidebands.
Identifiers: *Optical waveguides.

The long-range objective of this program is to develop an efficient and reliable ultra-wideband thin-film modulator for CO2 lasers that will be useful for high-resolution, imaging optical radars and high-data-rate optical communication systems. During the present reporting period (September

26, 1973 to Mar 25, 1974), the goal of this program is the demonstration of efficient sideband generation at microwave frequencies (X-band or Ku-band) from the 10.6 micrometer CO2 molecular resonance. For the remaining contractual period (March 26, 1974 to June 25, 1974), the goal is to experimentally demonstrate the generation of frequency-chirped 10.6 micrometer CO2 laser waveforms using the microwave-driven thin-film modulator developed under the present contract. Characteristics of the frequency chirped optical signals, sideband power limitations and total optical insertion loss of the microwave-driven thin-film modulator will be investigated. In particular, techniques for improving coupling efficiency of both optical and microwave power will be determined.

AD-776 713/0GA PC$10.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
OPTIC QUANTUM GENERATORS,
E. F. Ishchenko, and Yu. M. Klimkov. 22 Feb 74, 570p Rept no. FTD-HC-23-486-74
Edited trans. of mono. Opticheskie Kvantovye Generatory, Moscow, 1968 p1-470.

Descriptors: *Lasers, Monochromatic radiation, Coherent radiation, Polarization, Power, Laser beams, Radiation effects, Laser cavities, Gas lasers, Solid state lasers, Semiconductor lasers, Test methods, Translations, USSR.

The main optical characteristics of radiation: monochromatism, coherence, directionality, polarization and power are considered. Problems of the interaction of radiation and the inversion medium and optical cavities are considered and the corresponding terminology is presented. The main types of lasers (gas, solid-state and semiconductor), the principles of their action, operating principle and main parameters are described. Problems related to practical use of lasers are discussed, methods of measuring the main parameters and characteristics of lasers are described and methods, formulas and examples of calculation or estimation of the parameters of the device and selection of some of its components are presented. General problems related to most applications of lasers, and also several specific examples are considered. The structure of electron shells, notations of excited states and the system of energy units used in spectroscopy are described in the appendices.

AD-776 748/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE POSSIBILITY OF DEVELOPING PULSE GAS LASERS WITH PUMPING BY AN ELECTRON BEAM IN AN ELECTRIC FIELD,
Yu. V. Afanassev, E. M. Belenov, O. V. Bogdankevich, V. A. Danilychev, and S. G. Darznik. 8 Mar 74, 10p Rept no. FTD-HT-23-716-74
Edited trans. of Vysokomolekulyarnye Soedineniya. Seriya B: Kratkie Soobshcheniya (USSR) n11 p23-27 Nov 70, by Robert D. Hill.

Descriptors: *Gas lasers, *Excitation, Electron irradiation, Translations, USSR.
Identifiers: Pulsed lasers.

A report is given concerning the possibility of developing pulse gas lasers with combined excitation when the pumping of the gas is produced simultaneously by an electron beam in an electric field. The proposed method of excitation fundamentally allows obtaining the high radiation power of laser owing to the uniform excitation at high pressures of large gas volumes. The role of the electron beam is reduced actually to the creation of conditions for a streamerless development of a discharge, and the excitation energy comes basically from the external electric field.

AD-776 804/7GA PC$5.00/MF$1.45
Raytheon Co Waltham Mass Research Div
VISIBLE AND INFRARED LASER-INDUCED DAMAGE TO TRANSPARENT MATERIALS.
Final rept. 1 Jan-31 Dec 73,
David W. Fradin, Michael Bass, Domenic P. Bua, and Lowell H. Holway, Jr. Jan 74, 156p Rept no. S-1660 ARCRL-TR-74-0082
Contract F19628-73-C-0127, ARPA Order-1434

Descriptors: *Laser materials, *Optical materials, *Radiation effects, *Carbon dioxide lasers, Gas lasers, Infrared lasers, Optical coatings, Mirrors, Optical glass, Alkali metal compounds, Sodium chloride, Zinc selenides.
Identifiers: TEA lasers, Design, YAG lasers, Potassium bromide, Potassium chloride, Self focusing.

The basic objectives of this program was to analyze data obtained from carefully controlled damage measurements at laser wavelengths between 0.69 and 10.6 micrometers and at various laser pulse durations. The effort was divided into six major areas: They were (1) design and assembly of a pulsed CO2 TEA laser for use in 10.6 micrometer damage measurements, (2) a study of the effects of lattice disorder, polycrystallinity, alloying, and atomic impurity doping on intrinsic damage fields, (3) measurements of the dependence of intrinsic breakdown fields on laser pulse duration, (4) bulk and thin film optical damage from inclusion absorption, (5) the relationship between self-focusing and optical damage, and (6) analytical studies of laser-induced electron avalanche breakdown.

AD-776 818/7GA PC$3.75/MF$1.45
Rand Corp Santa Monica Calif
PHYSICAL PRINCIPLES, MATERIALS GUIDELINES, AND MATERIALS LISTS FOR HIGH-POWER 10.6 MICROMETER WINDOWS,
Marshall Sparks. Sep 73, 57p* Rept no. R-863-PR
Contract F44620-73-C-0011

Descriptors: *Infrared windows, *Laser materials, Infrared lasers, Carbon dioxide lasers, Physical properties, Thermal properties, Optical properties, Tables(Data).

No materials available when this research was performed were useful for 10.6-micron laser windows at the power levels and beam diameters of interest. Some available materials were too weak structurally, whereas other, strong enough, tended to distort the beam when they absorbed its heat. This report discusses the problems and the physical principles underlying them. It sets up guidelines for the search for, and the selection of, suitable materials. Then, by using these guidelines and the figures of merit already established, along with the known properties of a few materials, the author isolates a narrow choice of materials for early experimental investigation. (Author)

AD-776 849/2GA Reprint
Yale Univ New Haven Conn Dept of Physics
APPROACH TO THERMODYNAMIC EQUILIBRIUM (AND OTHER STATIONARY STATES),
Willis E. Lamb, Jr. 1973, 24p AFOSR-TR-74-0426
Contract F44620-71-C-0042, Grant NGR-07-004-035
Availability: Pub. in The Physicist's Conception of Nature, p527-547 1973.

Descriptors: *Lasers, *Thermodynamics, Equilibrium, Quantum theory.

A lecture given at the Symposium on 'The Physicist's Conception of Nature' held at Trieste, Italy in September 1972 which was held in honor of P.A.M. Dirac on the occasion of his seventieth birthday. The techniques developed by M.O. Scully and the author in their quantum theory of the laser are applied to discuss the problem of the approach of a dynamic system (simple harmonic oscillator) to a steady state when the system is placed in contact with a reservoir. The time dependence is indicated in a number of computer generated figures. If the reservoir has a temperature T>0, the system relaxes to thermodynamic equilibrium at that temperature. If the reservoir is described by a negative temperature the system approaches a state of (laser) oscillation.

AD-912 102/1GA PC$4.00/MF$1.45
General Electric Co., Philadelphia, Pa. Space Div.
PULSED METAL VAPOR LASERS.
Quarterly rept. on Phase 2,
Thomas W. Karras, R. S. Anderson, B. G. Bricks, and W. E. Austin. Jul 73, 16p
Contract N00014-73-C-0042, ARPA Order-2212
Distribution Limitation now Removed.

Descriptors: (*Gas lasers, Bismuth), Electric arcs, Light pulses, Sparks, Electric discharges, Electrodes, Copper, Polarization, Atomic energy levels, Vapor pressure, Vapors, Quenching(Inhibition), Buffers, Helium, Neon, Argon, Krypton, Mirrors, Reflectivity, Sputtering.
Identifiers: Brewster windows, *Metal vapor lasers, Optical apertures.

The principal effort of this phase of the program has been directed toward an attempt to demonstrate a bismuth vapor laser emitting at 4722 A. This has involved some fundamental spectroscopic studies of bismuth and copper vapor discharges and a copper vapor laser. This goal has also required substantial effort directed toward developing a fast risetime discharge in the bismuth vapor and improving the operation of the bismuth vapor generator. Finally, work was also done to extend the operating time of the quenching spark gaps at high repetition rates and power levels for application to the metal vapor lasers. (Author)

AD-914 423/9GA PC$5.00/MF$1.45
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
MINIATURE MOLECULAR FREQUENCY SOURCE.
Interim technical rept. no. 1, 15 Nov 72-15 Jun 73,
James J. Gallagher. Jun 73, 40p ECOM-0065-1-73
Contract DAAB07-73-C-0065
Distribution Limitation now Removed.

Descriptors: (*Frequency stabilizers, Molecules), (*Radiofrequency oscillators, High frequency), (*Gas lasers, Carbon dioxide), (*Molecular spectroscopy, Infrared spectroscopy), Molecular energy levels, Phase modulation, Frequency multipliers, Feedback, Harmonic generators, Sensitivity, Accuracy, Excitation, Infrared lasers, Nonlinear systems, Fluorescence, Infrared radiation, Electrooptics, Shock resistance, Nitrogen, Glass seals, Infrared detectors, Cadmium compounds, Tellurides, Indium antimonides, Lead compounds, Selenides, Mirrors, Cavity Resonators, Quartz.
Identifiers: Absorption cells, Lamb dip, Middle infrared region, Far infrared region, Room temperature, Vibration spectra, Rotation spectra, Emission spectra, Cadmium tellurides, Lead selenides, Rotation States, Vibration states.

The initial investigations on a miniature molecular frequency source are discussed. Studies on a small sealed-off CO2 laser, modulator, external control cell and detector schemes are described. Calculations have been performed to estimate the detector sensitivity at 300 K. Preparations for laboratory tests, laser sealing techniques and initial assembly of the molecular frequency source are currently being studies. (Author)

COM-74-10674/1GA PC$5.75/MF$1.45
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
ACTIVE AND PASSIVE MODE LOCKING OF CONTINUOUSLY OPERATING RHODAMINE 6G DYE LASERS.
Summary rept.,
Andre Scavennec, and N. S. Nahman. Feb 74, 55p NBSIR-73-347

Descriptors: *Lasers, Dyes, Light pulses, Continuous radiation, Modulation.
Identifiers: *Mode locked lasers, *Organic dye lasers, Rhodamine 6G, Xanthene dyes.

Using confined and unconfined fluid flow dye cells with suitable mode locking methods continuously operating Rhodamine 6G dye lasers have been built to produce narrow pulses (less than 40 ps) at about a 140 MHz pulse repetition rate. For active (acoustic) amplitude modulation mode locking methods optical pulses were obtained having about a 32 ps pulse width (FWHM). For passive mode locking methods optical pulses of < or = 35 ps pulse width (FWHM) were obtained. A three mirror cavity was used for the active mode locking studies while three and five mirror cavities were used in the passive studies. The three mirror passive mode locked laser employed a single dye cell containing both the Rhodamine 6G (gain) and DODCI (loss) solutes in a single solution having glycol as the solvent. The active and passive mode locked carrier wavelengths were about 5900 A and 5800 A, respectively. (Author)

COM-74-10693/1GA PC$4.00/MF$1.45
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
TUNABLE LASER SOURCE TECHNIQUES APPLIES TO THE ULTRAVIOLET SPECTRA OF NITROGEN OXIDES.
Final rept., 1 Apr 72-30 Jun 73,
James J. Gallagher. 23 Aug 73, 17p NOAA-74022702
Grant NOAA-N22-145-72(G)

Descriptors: *Ultraviolet lasers, Absorption spectroscopy, Nitrogen oxide(NO), Fluorescence, Design, Flash lamps, Frequency multipliers, Amplification.
Identifiers: *Dye lasers, *Tunable lasers, Frequency doublers, Optical mixing, Harmonic generators.

Investigations have been performed on techniques for the generation of tunable ultraviolet radiation for fluorescent spectroscopy of nitrogen oxide molecules. Dye lasers and the improvement of their power output have been studied. Harmonic generation and nonlinear optical mixing schemes have been considered. Amplification of the dye laser output and construction of various flashlamp configurations have been studied. The features of nitrogen oxide spectra important to fluorescence observations have been outlined. (Author)

COM-74-50199/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MECHANISMS FOR SELF-FOCUSING IN OPTICAL GLASSES.
Final rept.,
Albert Feldman, Deane Horwitz, and Roy M. Waxler. Nov 73, 8p
Contract ARPA Order-2016
Pub. in IEEE Jnl. of Quantum Electronics, QE-9 n11 p1054-1061 Nov 73.

Descriptors: *Laser beams, *Optical glass, Focusing, Kerr electrooptical effect, Electrostriction, Refractive index, Absorption, Radiation damage, Thermodynamic properties.
Identifiers: *Self focusing, Neodymium glass lasers.

The relative contributions of the Kerr, electrostrictive, and thermal effects to the self-focusing thresholds of borosilicate crown glass, fused silica, and dense flint glass have been estimated from an analysis of damage threshold data for linearly polarized and circularly polarized radiation. The measurements were made with a Nd:glass laser operating in the TEM00 mode with a temporal pulse width of 25 ns. The Kerr effect appears to be the largest effect. The thermal effect is also significant. The electrostrictive effect is smallest. Reasonable values of the absorption coefficient are calculated from the thermal contribution. The results are in qualitative agreement with the work of others.

COM-74-50262/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE JOSEPHSON JUNCTION AS APPLIED TO THE MEASUREMENT OF THE FREQUENCIES OF SEVERAL LASER LINES.
Final rept.,
Allan S. Risley. 1972, 4p
Pub. in Frequency Standards and Metrology Seminar, Quebec, Canada, 30 Aug-1 Sep 71 p325-328.

Descriptors: *Lasers, *Frequency measurement, *Josephson junctions.

The Josephson Junction has been applied to the measurement of laser frequencies as high as 3.8 THz by direct multiplication from an X-band source. An attempt is being made to extend this technique to frequencies as high as 10.7 THz.

20F. Optics

AD-776 430/1GA Reprint
California Univ Berkeley Electronics Research Lab
SIMULTANEOUS EXPOSURE AND DEVELOPMENT TECHNIQUE FOR MAKING GRATINGS ON POSITIVE PHOTORESIST,
Won-Tien Tsang, and Shyh Wang. 16 Nov 73, 6p
AROD-7101.18-E
Contract N00014-69-A-0200-1063, Grant DA-ARO-D-31-124-71-G36
Availability: Pub. in Applied Physics Letters, v24 n4 p196-199, 15 Feb 74.

Descriptors: *Diffraction gratings, *Holograms, *Manufacturing, Optical equipment, Waveguides.
Identifiers: *Photoresist techniques, Optical waveguides.

A simultaneous exposure and development technique for forming diffraction gratings and recording holograms in positive photoresist is described. This technique not only reduces the exposure time significantly, but is also able to produce gratings with deep grooves and sharp ridges. With the photoresist placed in a liquid-filled prismlike container, the smallest period obtainable by this method is reduced by a factor equal to the index of refraction of the liquid. (Author)

AD-776 480/6GA Reprint
Georgia Inst of Tech Atlanta School of Physics
SYNCHROTRON RADIATION AS AN INFRARED SOURCE,
James R. Stevenson, H. Ellis, and Roger Bartlett. 28 Mar 73, 7p AFOSR-TR-74-0328
Contract F44620-70-C-0029, Grant AF-AFOSR-1892-70
Availability: Pub. in Applied Optics, v12 n12 p2884-2889 Dec 73.

Descriptors: *Light sources, *Infrared radiation, Electron accelerators, Blackbody radiation.
Identifiers: *Synchrotron radiation.

The increasing availability of synchrotron radiation sources in a number of geographical regions of the world has motivated an evaluation of the radiation from electron accelerators and storage rings as a possible source for ir spectroscopy. As synchrotron radiation can be analytically described, a direct comparision is made with blackbody radiation for typical solid state spectroscopy. Both existing and proposed synchrotron radiation sources are found to be attractive in the ir. The ultrahigh vacuum environment of the source is compatible with clean surface investigations, the analytical description of the radiation is appripriate for calibration studies, and the continuous nature is suitable for Fourier spectroscopy or whenever a white light source is desirable. (Author)

AD-776 530/8GA Reprint
Franklin Inst Swarthmore Pa Bartol Research Foundation
OPTICAL SECOND-HARMONIC GENERATION FROM SUBMONOLAYER NA-COVERED GE SURFACES,
J. M. Chen, J. R. Bower, C. S. Wang, and C. H. Lee. 1 Aug 73, 5p AROD-8906.8-P
Grant DA-ARO-D-31-124-73-G124
Prepared in cooperation with Maryland Univ., College Park. Dept. of Electrical Engineering.
Availability: Pub. in Optics Communications, v9 n2 p132-134 Oct 73.

Descriptors: *Germanium, *Light transmission, Harmonic analysis, Sodium, Surface properties, Work functions.
Identifiers: *Second harmonic generation.

Optical second harmonic generation (SHG) from centro-symmetric crystals is restricted to the surface. It is found that submonolayers of Na on Ge caused drastic increases in SHG. The different effects of Na on SHG of Ge(111) and Ge(100) were correlated with surface structure and work function. The experimental results cannot be explained by a dipole layer model. The increase in SHG is attributed to the growth of patches of metallic Na. (Author)

AD-776 909/4GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
DEGRADATION OF A HELIUM-NEON LASER BEAM BY ATMOSPHERIC DUST DURING A SAND STORM.
Technical rept.,
A. J. Blanco, E. M. D'Arcy, and J. B. Gillespie. Mar 74, 14p Rept no. ECOM-5535

Descriptors: *Laser beams, *Light scattering, *Dust storms, Experimental design, Dust, Density.
Identifiers: *Atmospheric attenuation, Helium neon lasers.

Simultaneous measurements of scattered laser energy (6328A) and atmospheric particle concentration within three size ranges were made to determine the distribution of scattered energy as a function of angle and particulate concentration. A high number concentration was provided by a short but intense sand storm which fortuitously passed through the array during the experiment. Single and multiple regression techniques were applied to data taken at the peak of the storm and to that taken after it had subsided. Experimental results were used to derive empirical models in estimating the scattered energy distribution under both high and low background levels of particulate concentrations. (Author)

AD-777 022/5GA PC$3.25/MF$1.45
Franklin Inst Research Labs Philadelphia Pa
RADIO CONTROLLED IR INDICATOR LIGHT FOR MILITARY DOGS.
Final rept. Oct-Dec 73,
John W. Woestman. Dec 73, 45p Rept no. FIRL-F3538-06 LWL-CR-04B72
Contract DAAD05-73-C-0145

Descriptors: *Indicator lights, *Infrared equipment, *Infrared detectors, Dogs, Infrared detection, Position finding, Night vision devices, Remote control.
Identifiers: Radio control.

A radio controlled IR light mounted on a dog harness was developed to enable a military dog handler to visualize, with the aid of an appropriate IR viewing device, the location of his dog at night. The system consists of a hand-held radio transmitter and the dog-mounted receiver unit with a pulsed IR light source. (Author)

AD-777 029/0GA PC$3.25/MF$1.45
Naval Electronics Lab Center San Diego Calif
WAVEGUIDE TECHNIQUES FOR INTEGRATED OPTICS.
Research and development rept. 1 Apr-30 Sep 73,
W. M. Caton, and T. G. Paviopoulos. 30 Jan 74, 33p Rept no. NELC-TR-1909

ARPA Order-2158

Descriptors: *Fiber optics transmission lines, *Waveguides, *Electrooptics, Optical equipment, Integrated circuits, Light emitting diodes, Thin films, Semiconductor diodes.
Identifiers: *Optical waveguides.

The advancement of integrated optics circuits and fiber optics with a view to their application in Navy and other DoD systems is the objective of this ARPA-sponsored NELC program. This report documents progress in a number of areas. Patterns for direct optical waveguides have been fabricated in different materials by electron beam exposure of electron resist. Studies have been performed on the efficiency of planar horn-shaped regions in waveguides as coupling devices. An electron beam microscope has been used to measure the variation in the concentration of the electrically active impurities in laser diodes and other semiconductor structures. An apparatus has been constructed for the measurement of the refractive index of thin films. Low-loss channel waveguides have been produced by focusing an argon ion cw laser with the aid of a microscopic objective on the surface of a piece of highly absorbing glass. (Modified author abstract)

COM-74-50196/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A STANDARD FOR NIGHT VISION DEVICES FOR LAW ENFORCEMENT.
Final rept.,
Joseph C. Richmond. 1973, 7p
Pub. in Proceedings of the Society of Photo-Optical Instrumentation Engineers, 27-29 Aug 73, San Diego, Calif. p109-115.

Descriptors: *Optical equipment, Night vision, Low light level viewing, Law enforcement, Standards.
Identifiers: *Night vision devices.

The paper mentions some of the philosophy behind the standard, lists the performance requirements and describes briefly the test procedures for (a) focus adjustment, curvature of field and distortion of the eyepiece lens, (b) optical gain, optical gain stability, light equivalent background, light induced background, luminance of output screen, luminance uniformity, cathode and screen quality, contrast transfer function, distortion and flare of a night vision device complete with objective lens, but with the eyepiece removed, and (c) for resistance to vibration, high and low temperature storage, operation and thermal shock and humidity of night vision devices complete with both objective and eyepiece lenses, and (d) boresight adjustment, click movement and resistance to mechanical shock of night vision devices intended for use as rifle sights.

COM-74-50238/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Heat Div.
OPTICAL RADIATION MEASUREMENTS. APPROXIMATE THEORY OF THE PHOTOMETRIC INTEGRATING SPHERE.
Technical note (Final),
W. B. Fussell. Mar 74, 40p NBS-TN-594-7
See also report dated Jun 73, COM-73-50532.
Paper copy available from GPO $0.75 as C13.46:594-7.

Descriptors: *Incandescent lamps, *Luminous intensity, *Calibrating, Standards, Error analysis.

An approximate mathematical theory of the photometric integrating sphere is developed. The analysis is accurate to the first order in the ratio of the baffle area to the sphere wall area. The sphere is assumed to be occupied by a circular baffle and a spherical lamp; the centers of the baffle and the lamp lie on a diameter of the sphere. The surfaces of the sphere and the baffle are assumed to reflect in a uniformly diffuse manner. The lamp is assumed to absorb a fraction of the radiation incident upon it, and to transmit (or specularly reflect) the remainder. The luminance distribution at the sphere window is derived for a general source input at any point of the sphere wall. A model lamp illuminance distribution is assumed, and a formula for the fractional error in comparing the total luminous fluxes of two lamps in the integrating sphere, is derived. The physical significance of the formula is described. (Author)

COM-74-50266/7GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Heat Div.
OPTICAL RADIATION MEASUREMENTS: THE PRESENT STATE OF RADIOMETRY AND PHOTOMETRY.
Final rept.,
Bruce Steiner. Mar 74, 56p NBS-TN-594-6
Paper copy available from GPO $0.95 as C13.46:594-6.

Descriptors: *Photometry, *Radiometry, Reviews, Standards.
Identifiers: *State of the art.

The electro-optics industry and the public that depends on it are part of an informal but influential system for optical radiation measurement. The growth of this industry and of public concerns related technically to it have put severe new strains on this measurement system. The system itself must therefore be analyzed. The state of the art, on which the measurement system depends, is surveyed in terms of basic measurement parameters. The measurement system is analyzed in terms of its three basic components: the flow of physical standards, the generation of procedural standards; and the funding framework. The roles of the professional society and of the Council for Optical Radiation Measurement are reviewed. New requirements of the system are identified. Finally, the methodology of the study is reviewed in detail. (Author)

LBL-2331 PC$4.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
FOUR FUNCTION CALCULATOR USED TO AUTOMATICALLY COMPUTE WAVELENGTH.
M. Nakamura, and G. V. Shalimoff. Dec 73, 17p
Contract W-7405-eng-48

Descriptors: (*Optical spectrometers, *Readout systems), Optical systems, Photographic films, Spectra.

For abstract, see NSA 29 07, number 17967.

N74-17294/1GA PC$4.25/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Automatique.
RADIATION DAMAGE MECHANISMS IN OPTICAL MATERIALS LES MECANISMES DE DEGRADATION SOUS RAYONNEMENT DANS LES MATERIAUX OPTIQUES.
J. Bourrieau, J. C. Mandeville, and M. Romero. 1973, 23p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Optical equipment, *Radiation effects, *Space environment simulation, *Vitreous materials, Ceramics, Color centers, Micrometeoroids, Mirrors, Transparence.

For abstract, see STAR 1208

N74-17406/1GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ADVANCED ELECTRO-OPTICAL IMAGING TECHNIQUES.
S. Sobieski, and E. J. Wampler. 1973, 134p NASA-SP-338, LC-73-600316
Conf-Symp. Held at Washington, D. C., 22 Sep. 1972.

Descriptors: *Camera tubes, *Conferences, *Electro-optics, *Large space telescope, Electrostatics, Image transducers, Photocathodes, Photometry, Return beam vidicons, Television cameras, Thermionic emission, Ultraviolet spectra.

For abstract, see STAR 1208

SLA-73-777 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ELECTROOPTIC DEVICES UTILIZING QUADRATIC PLZT CERAMIC ELEMENTS.
J. T. Cutchen, J. O. Jr. Harris, and G. R. Laguna. Aug 73, 17p CONF-730969-1

Descriptors: (*Electronic equipment, *Optical systems), Ceramics, Display devices, Electronic circuits, Holography, Kerr effect, Lanthanum oxides, Lead oxides, Titanium oxides, Visible radiation, Zirconium oxides.

For abstract, see NSA 29 07, number 18025.

20G. Particle Accelerators

AECL-4658 PC$3.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
ROLE OF ELECTRICALLY PRODUCED NEUTRONS IN NUCLEAR POWER GENERATION.
J. S. Fraser, C. R. J. Hoffmann, and P. R. Tunnicliffe. Oct 73, 33p CONF-730849-3
U.S. Sales Only.

Descriptors: (*Linear accelerators, Neutron sources), (*Neutron sources, *Accelerator facilities), (*Plutonium 239, *Breeding), (*Uranium 233, Breeding), Economics, Kev range 100-1000, Protons, Spallation, Targets.

For abstract, see NSA 29 07, number 16449.

BNL-18417 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
STABILITY OF BUNCHED BEAMS AGAINST HIGH ORDER NONLINEAR RESONANCES.
M. Month. 7 Dec 73, 14p

Descriptors: (*Cyclic accelerators, *Beam dynamics), Betatron oscillations, Resonance, Stability, Synchrotron oscillations.

For abstract, see NSA 29 07, number 15783.

BNL-18528 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
MULTIPARTICLE DETECTOR FOR ISABELLE.
J. Kirz. Nov 73, 6p

Descriptors: (*Isabelle storage ring, *Multiparticle spectrometers), Beam acceptance, Magnetic spectrometers, Vacuum systems.

For abstract, see NSA 29 07, number 16448.

BNL-50381 PC$12.75/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
RESEARCH APPLICATIONS OF SYNCHROTRON RADIATION. PROCEEDINGS OF A STUDY-SYMPOSIUM HELD AT BROOKHAVEN NATIONAL LABORATORY, SEPTEMBER 25–28, 1972.
R. E. Watson, and M. L. Perlman. Jun 73, 211p
CONF-7209107-
Contract AT(30-1)-16

Descriptors: (*Synchrotron radiation, *Meetings), (*X-ray spectroscopy, Meetings), Absorption spectroscopy, Astronomy, Atoms, Biology,

Biomedical radiography, Diffraction, Ionization, Microscopy, Molecules, Proteins, Ultraviolet radiation, X-ray diffraction.

For abstract, see NSA 29 07, number 16092.

CNEA-353 PC$3.50/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
BUENOS AIRES ISOTOPE-SEPARATOR ON-LINE FACILITY (IALE PROJECT). I. PLANNING AND INITIAL EXPERIENCES.
E. O. Achterberg, E. Y. de Aisenberg, and F. C. Iglesias. 1973, 29p
In Spanish. U.S. Sales Only.

Descriptors: (*Uranium 235, Fission products), (*Fission products, *Electromagnetic isotope separation), (*Cockcroft-walton accelerators, *Accelerator facilities), Mass spectroscopy, On-line systems, Thermal fission.

For abstract, see NSA 29 07, number 16450.

IPNO-72-6 PC$3.00/MF$1.45
Paris-11 Univ., 91 - Orsay (France).
PRODUCTION OF A FE EXP - BEAM BY CATHODE SPUTTERING IN A PENNING SOURCE.
M. Dumail, and G. C. Lottet. 1972, 7p
In French. U.S. Sales Only.

Descriptors: (*Penning ion sources, *Performance), (*Iron ions, Penning ion sources), Cathode sputtering.

For abstract, see NSA 29 07, number 16755.

ITEF-29 PC$3.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Teoreticheskoj I Ehksperimental'Noj Fiziki.
MEASUREMENT OF THE EMITTANCE OF A BEAM (OF IONS) AT THE OUTLET OF THE LINEAR ACCELERATOR I-2.
V. A. Batalin, R. P. Kuibida, and V. E. Sherman. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Linear accelerators, *Beam monitoring), (*Beam monitors, *Beam emittance).

For abstract, see NSA 29 07, number 16437.

JPRS-61358 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
RESEARCH DEVELOPMENT ON THE CREATION OF LINEAR ELECTRON ACCELERATORS IN THE MOSCOW PHYSICAL ENGINEERING INSTITUTE,
O. A. Valdner. 28 Feb 74, 14p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n12 p14-22 1972.

Descriptors: *Particle accelerators, Linear accelerators, Electron accelerators, Waveguides, Irises(Mechanical apertures), Translations, USSR.

The report contains a discussion of the various uses of charged particle accelerators, circular iris waveguides, and high-frequency separators.

JPRS-61364 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
RADIATION INSTALLATIONS AT THE TOMSK POLYTECHNICAL INSTITUTE,
A. N. Didenko. 1 Mar 74, 16p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n12 p23-31 Dec 72.

Descriptors: *Particle accelerators, *Nuclear physics, Betatrons, Synchrotrons, Cyclotrons, Translations, USSR.

The report contains a discussion of the various radiation installations at the Tomsk Polytechnical Institute. The 1.5 Gev electron synchrotron, waveguide synchrotrons, micrtrons, induction accelerators, cyclotrons, and the 2.5 Mev electrostatic generator are described.

LA-UR-73-1832 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
MESON FACTORIES, PI MESON DELIVERY, AND PI MESON DOSIMETRY FOR CANCER THERAPY.
E. A. Knapp. 1973, 9p CONF-731123-1
Contract W-7405-eng-36

Descriptors: (*Lampf linac, Pion beams), (*Pion beams, *Beam production), Pion dosimetry, Radiotherapy.

For abstract, see NSA 29 07, number 16451.

LA-tr-73-53 PC$3.00/MF$1.45
An Ukrainskoj SSR, Kharkov. Fiziko-Tekhnicheskij Inst.
STUDY OF THE CHARACTERISTICS OF A LINEAR ACCELERATOR OPERATING IN A TRANSFORMATION-WAVE MODE.
V. A. Bomko, A. P. Kliucharev, and B. I. Rudiak. 1972, 15p
Translated by A. D. Cernicek from KHFTI--72-44.

Descriptors: (*Linear accelerators, *Heavy ions), Electromagnetic fields, Mev range 01-10, Multicharged ions, Operation.

For abstract, see NSA 29 07, number 16430.

NP-19931 PC$3.75/MF$1.45
An Sssr, Moscow. Fizicheskij Inst.
FUTURE OF NEW COLLECTIVE METHODS OF ACCELERATION.
M. S. Rabinovich, and V. N. Tsytovich. 1973, 32p
U.S. Sales Only.

Descriptors: (*Collective accelerators, *Reviews), Electron-ring accelerators, Operation, Planning.

For abstract, see NSA 29 07, number 16431.

RL-73-129 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
NIMROD OPERATION AND DEVELOPMENT QUARTERLY REPORT, APRIL 1--JUNE 30, 1973.
D. E. Gray. Oct 73, 13p
U.S. Sales Only.

Descriptors: (*Nimrod, *Operation), High energy physics, Personnel dosimetry, Research programs.

For abstract, see NSA 29 07, number 16432.

20H. Particle Physics

AD-776 711/4GA Reprint
Oregon Univ Eugene Dept of Physics
SOME ASPECTS OF ATOMIC EFFECTS IN NUCLEAR TRANSITIONS,
Bernd Crasemann. 1973, 7p AROD-10121.8-P
Grant DAHC04-74-G-0065
Availability: Pub. in Nuclear Instruments and Methods, v112 p33-39 1973.

Descriptors: *Alpha decay, *Beta decay, *Gamma decay, Wave functions.

In nuclear decay or deexcitation, the entire atom (including its electron cloud) undergoes a transition. Thus, atomic as well as nuclear, lepton, and photon variables must be included in a complete description of initial and final states. In the paper, the author briefly examines the effect which the presence of atomic electrons has on beta and gamma decay rates, and the role which it plays in some higher-order processes. To the extent to which environmental factors affect atomic electron wave functions they can modify nuclear transition rates in which electrons are involved; some characteristics of such perturbing effects are sketched. (Author)

AD-776 738/7GA Reprint
Wayne State Univ Detroit Mich
S- AND P-WAVE NEUTRON SPECTROSCOPY. PART XD: INTERMEDIATE STRUCTURE, PARTICLE-VIBRATION STATES,
M. Divadeenam, William P. Beres, and Henry W. Newson. 7 Nov 72, 11p AROD-10014.3-P
Grant DA-ARO-D-31-124-72-G58
Prepared in cooperation with North Carolina Central Univ., and Duke Univ.
Availability: Pub. in Annals of Physics, v80 n2 p231-241 Oct 73.

Descriptors: *Nuclear resonance, Neutron scattering, Lead(Metal), Bismuth.
Identifiers: Lead 208, Lead 209, Bismuth 210, *Neutron spectroscopy.

The weak coupling particle-vibration model is extended to lowlying neutron resonances in certain even-even or odd-odd nuclei by coupling the extra particle to core excited states of the odd mass target. The odd hole or particle in the target is treated as a passive spectator. 208Pb and 210Bi are studied as test cases and the calculated resonance quantities are in good general agreement with the average features of high resolution experiments. The resonances in 208Pb and 210Bi are related to the same intrinsic doorway in 209Pb. The 210Bi data is presented here for the first time. (Author)

AD-777 630/8GA PC$3.75/MF$1.45
Naval Research Lab Washington D C
CROSS SECTIONS OF PROTON-NUCLEUS INTERACTIONS AT HIGH ENERGIES,
Rein Silberberg, and Chen-Hsiang Tsao. 21 Dec 73, 68p Rept no. NRL-7593

Descriptors: *Proton reactions, *Neutron reactions, *Nuclear cross sections, Cosmic rays, Solar flares, Radiation shielding, Radiotherapy, Tables(Data).

The measured partial cross sections for high energy proton-nucleus interactions have been compiled from more than 200 publications. The targets range from lithium to uranium; the products considered have mass number A > or = 6. A comparison of cross section induced by protons and 4He is tabulated. Also a table of cross sections for (p, xn) reactions is given. These cross sections are useful for studies of interactions of cosmic rays and solar flare particles, as well as in radiation shielding and radiation therapy. These cross sections were used by the authors to develop semiempirical equations for calculating partial cross sections that have not yet been measured. (Author)

AE-265 PC$3.00/MF$1.45
Aktiebolaget Atomenergi, Stockholm (Sweden).
DECAY PROPERTIES OF EXP 147 ND.
A. Backlin, and S. G. Malmskog. 1967, 15p
U.S. Sales Only.

Descriptors: (*Neodymium 147, *Beta-minus decay), (*Promethium 147, *Energy-level transitions), Branching ratio, Excited states, Ft value, Internal conversion, Multipolarity, Parity, Probability, Spin.

For abstract, see NSA 29 07, number 17213.

AECL-4601 PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
NUCLEAR PHYSICS WITH A HIGH FLUX NEUTRON FACILITY.
G. A. Bartholomew. Oct 73, 16p
U.S. Sales Only.

Descriptors: (*Neutron reactions, *Reviews), Neutron beams, Nuclear physics, Uses.

For abstract, see NSA 29 07, number 17214.

AECL-4602 PC$3.50/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
RELATIONSHIP BETWEEN THE SPHERICAL SHELL MODEL AND THE DEFORMED HARTREE--FOCK MODEL FOR NUCLEI.
M. Harvey. Oct 73, 27p CONF-730673-2
U.S. Sales Only.

Descriptors: (*Shell models, *Hartree-fock method), (*Neon 20, *Energy levels), (*Silicon 28, Energy levels), Argon 36, Calcium 40, Hamiltonians, Magnesium 24, Nuclear deformation, Nuclear potential, Nuclear structure, Oxygen 16, Particle models, Residual interactions, Spherical model, Sulfur 32.

For abstract, see NSA 29 07, number 17315.

AECL-4604 PC$3.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
MIRROR NUCLEI, A LESS THAN OR EQUAL TO 100.
J. C. Hardy. Aug 73, 31p CONF-730673-1
U.S. Sales Only.

Descriptors: (*Mirror nuclei, *Beta decay), (*Intermediate mass nuclei, Beta decay), Corrections, Electric potential, Half-life, Intermediate vector bosons, Isospin, Mass, Multiplets, Nuclear forces, Parity, Spin, Weak interactions.

For abstract, see NSA 29 07, number 17215.

AEEW-M-1208 PC$3.00/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
CURRENT EDITION OF THE MAIN TAPE NDL-1 OF THE UK NUCLEAR DATA LIBRARY, MARCH 1973.
A. L. Pope. Dec 73, 10p
U.S. Sales Only.

Descriptors: (*Neutron reactions, *Data), Cross sections, Energy range, Nuclear data collections, United kingdom.

For abstract, see NSA 29 07, number 17089.

ANL/HEP-7344 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
MEASUREMENT OF POLARIZATION IN PI EXP - P IMPLIES K EXP 0 LAMBDA EXP 0 AT 5 GEV/C.
C. E. W. Ward, I. Ambats, A. Lesnik, W. T. Meyer, and D. R. Rust. Sep 73, 12p

Descriptors: (*Lambda particles, *Polarization), (*Pion-proton interactions, Polarization), Decay, Gev range 01-10, Kaons neutral, Linear momentum, Particle production.

For abstract, see NSA 29 07, number 16913.

ANL/HEP-7345 PC$4.50/MF$1.45
Argonne National Lab., Ill. (Usa).
CAN MUELLER REGGE MODELS DESCRIBE INCLUSIVE DATA CONSISTENTLY.
S. S. Pinsky, and G. H. Thomas. Oct 73, 49p COO-1545-133

Descriptors: (*Inclusive interactions, *Regge poles), (*Pions, *Particle production), Boundary conditions, C invariance, Correlations, Coupling, Pion-pion interactions, Regge trajectories, Resonance particles, Scale invariance.

For abstract, see NSA 29 07, number 16927.

ANL/HEP-7350 PC$5.00/MF$1.45
Argonne National Lab., Ill. (Usa).
QUASI-ELASTIC NEUTRINO REACTIONS: FORM FACTORS.
M. Derrick. 1973, 56p CONF-730842-5

Descriptors: (*Neutrino-neutron interactions, *Form factors), (*Neutrino-proton interactions, Form factors), Antineutrinos, Lambda particles, Muons minus, Muons plus, N*resonances, Particle production, Protons, Quasi-elastic scattering, Reviews, Vectors.

For abstract, see NSA 29 07, number 16888.

ANL/NDM-3 PC$4.00/MF$1.45
Argonne National Lab., Ill. (Usa).
NEUTRON SCATTERING FROM TITANIUM: COMPOUND AND DIRECT EFFECTS.
E. Barnard, J. deVilliers, P. Moldauer, D. Reitmann, and A. Smith. 1 Oct 73, 39p
Contract W-31-109-eng-38

Descriptors: (*Titanium 46, *Energy levels), (*Titanium 47, Energy levels), (*Titanium 48, Energy levels), (*Neutron reactions, *Elastic scattering), Compound-nucleus reactions, Differential cross sections, Direct reactions, Energy, Excitation, Inelastic scattering, Kev range 100-1000, Mev range 01-10, Optical models, R matrix, Resonance, Titanium, Total cross sections, Variations.

For abstract, see NSA 29 07, number 17188.

CNRS-CPT-73-P-546 PC$6.50/MF$1.45
Centre National de la Recherche Scientifique, 13 - Marseille (France). Centre de Physique Theorique.
MODEL FOR SPIN PARTICLES IN THE ELECTROMAGNETIC AND GRAVITATIONAL FIELD.
J. M. Souriau. Jun 73, 88p
In French. U.S. Sales Only.

Descriptors: (*Electrons, *Particle models), (*Molecules, Particle models), (*Stars, Particle models), Coordinates, Dipole moments, Electric charges, Electromagnetic fields, Elementary particles, Gravitation, Gravitational fields, Linear momentum, Magnetic moments, Mathematical models, Particle structure, Spin.

For abstract, see NSA 29 07, number 16948.

CONF-731207-1 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
ETOE-2/MC EXP 2 -2/SDX MULTIGROUP NEUTRON CROSS-SECTION PROCESSING.
H. II Henryson, B. J. Toppel, and C. G. Stenberg. 1973, 20p

Descriptors: (*Computer codes, *E codes), Cross sections, Data processing, Fortran, Ibm computers, M codes, Multigroup theory, Neutron reactions, S codes.

For abstract, see NSA 29 07, number 17090.

COO-1195-269 PC$5.00/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Physics.
DECK MODEL CALCULATION OF PI EXP - P IMPLIES PI EXP - PI EXP + PI EXP - P.
G. Ascoli, R. Cutler, L. M. Jones, U. Kruse, and T. Roberts. Aug 73, 57p
Contract AT(11-1)-1195

Descriptors: (*Pion-proton interactions, *Deck effect), Angular distribution, A1-1070 resonances, Distribution, Final-state interactions, Mass, Monte carlo method, Partial waves, Particle production, Pi-1640 resonances, Pion-nucleon interactions, Pion-pion interactions, Pions minus, Pions plus, Protons, Scattering amplitudes, Symmetry.

For abstract, see NSA 29 07, number 17011.

COO-1764-187 PC$3.75/MF$1.45
Minnesota Univ., Minneapolis (Usa). Inst. Of Tech.
THEORETICAL AND HIGH ENERGY PHYSICS PROGRAMS. PROGRESS REPORT, SEPTEMBER 1, 1972--AUGUST 31, 1973.
1973, 32p
Contract AT(11-1)-1764

Descriptors: (*Nuclear reactions, *Research programs), (*High energy physics, Research programs).

For abstract, see NSA 29 07, number 17326.

COO-2025-4 PC$3.00/MF$1.45
Michigan Univ., Ann Arbor (Usa). Coll. Of Engineering.
ABSOLUTE FISSION CROSS-SECTION MEASUREMENTS.
G. F. Knoll. Dec 73, 13p
Contract AT(11-1)-2025

Descriptors: (*Neutron reactions, *Research programs), Fission, Michigan, Photoneutrons.

For abstract, see NSA 29 07, number 17298.

COO-2174-15 PC$9.50/MF$1.45
Columbia Univ., New York (Usa). Dept. Of Physics.
NEUTRON VELOCITY SPECTROSCOPY USING THE NEVIS SYNCHROCYCLOTRON. PROGRESS REPORT, JULY 30, 1972--JUNE 30, 1973.
J. Rainwater. Jun 73, 150p
Contract AT(11-1)-2174

Descriptors: (*Neutron spectroscopy, *Research programs), Neutron reactions, New york.

For abstract, see NSA 29 07, number 17219.

COO-2197-16 PC$3.00/MF$1.45
Wyoming Univ., Laramie (Usa).
PION-NUCLEON INTERACTION AND MESONIC ATOMS. PROGRESS REPORT, FEBRUARY 1, 1973--JANUARY 31, 1974.
G. A. Jr. Rebka, and R. Kunselman. 1974, 9p
Contract AT(11-1)-2197

Descriptors: (*Pion-proton interactions, *Research programs), (*Mesic atoms, Research programs), (*Hadronic atoms, Research programs), Antiprotons, Cross sections, Magnetic moments, Muonic atoms, Neutrons, Particle production, Pions minus, Pions plus, Sigma particles, X-ray spectra.

For abstract, see NSA 29 07, number 16914.

COO-3001-50 PC$3.00/MF$1.45
State Univ. Of New York, Stony Brook (Usa). Dept. Of Physics; Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
PADE APPROXIMANTS AND REALISTIC EFFECTIVE INTERACTIONS.
E. M. Krenciglowa, T. T. S. Kuo, E. Osnes, and B. Giraud. 1973, 12p
Contract AT(11-1)-3001

Descriptors: (*Light nuclei, *Nucleon-nucleon interactions), Diagrams, Energy, Interactions, Pade approximation, Shell models, Spin.

For abstract, see NSA 29 07, number 17327.

COO-3235-28 PC$3.00/MF$1.45
Brown Univ., Providence, R.I. (Usa). Dept. Of Physics.
NEW METHOD FOR DETERMINING K-MATRIX ELEMENTS.
D. J. Kouri, and F. S. Levin. 1973, 7p

Descriptors: (*K matrix, *Matrix elements), Integral equations, Mathematical operators, Partial waves.

For abstract, see NSA 29 07, number 17328.

COO-3285-11 PC$3.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa). Dept. Of Physics.
RESEARCH IN THEORETICAL PHYSICS. ANNUAL REPORT, APRIL 1, 1973--MARCH 31, 1974.
Dec 73, 21p
Contract AT(11-1)-3285

Descriptors: (*Hadron-hadron interactions, *Research programs), Boundary conditions, Cross sections, Decay, Distribution, Inclusive interactions, Particle production, Parton model, Perturbation theory, Regge trajectories, Scale invariance, Su-2 groups, Symmetry groups.

For abstract, see NSA 29 07, number 16984.

COO-3352-5 PC$3.00/MF$1.45
Massachusetts Inst. Of Tech., Cambridge (Usa).
THERMAL NEUTRON SCATTERING STUDIES OF MOLECULAR DYNAMICS AND CRITICAL PHENOMENA IN FLUIDS AND SOLIDS. ANNUAL PROGRESS REPORT, DECEMBER 1972--NOVEMBER 1973.
S. H. Chen. 1973, 11p
Contract AT(11-1)-3352

Descriptors: (*Gallium, *Research programs), (*Gases, Research programs), (*Thermal neutrons, *Scattering), Correlations, Liquid metals, Particles, Photons, Relaxation, Spectroscopy, Time dependence.

For abstract, see NSA 29 07, number 18019.

COO-3496-30 PC$3.00/MF$1.45
Rochester Univ., N.Y. (Usa). Nuclear Structure Research Lab.
ENERGY DEPENDENCE OF GAMMA/SUB F//GAMMA/SUB N/ FOR THE NUCLEUS EXP 216 RN.
H. Freiesleben, H. C. Britt, and J. R. Huizenga. 1973, 18p CONF-730823-22, SM-174-56
Contract AT(11-1)-3496

Descriptors: (*Bismuth 209, Lithium 7 reactions), (*Lithium 7 reactions, *Fission), Coincidence methods, Collective model, Compound nuclei, Coupling, Differential cross sections, Energy levels, Evaporation model, Excitation functions, Mev range 10-100, Nuclear potential, Radon 216, Rotational states, Total cross sections.

For abstract, see NSA 29 07, number 17277.

CRN/HE-73-11 PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, 67 - Strasbourg (France). Centre de Recherches Nucleaires.
MUON MASS AND THE UNIFIED GAUGE FIELD THEORY FOR LEPTONS.
J. Leite Lopes. 1973, 9p
U.S. Sales Only.

Descriptors: (*Heavy leptons, *Mass difference), (*Electrons, Mass difference), (*Muons, Mass difference), Leptons, Mass, Quantum field theory, Scalars, Weak interactions, Weinberg lepton model.

For abstract, see NSA 29 07, number 16976.

DESY-73-44 PC$4.50/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
ELECTROMAGNETIC INTERACTIONS.
S. C. C. Ting. Oct 73, 48p
U.S. Sales Only.

Descriptors: (*Electromagnetic interactions, *Reviews), (*Photon-electron interactions, *Quantum electrodynamics), (*Photon-muon interactions, Quantum electrodynamics), (*Photon-meson interactions, *Vector dominance model), Differential cross sections, Electron-proton interactions, Hadrons, Lectures, Photon-proton interactions, Photons, Scale invariance, Structure functions, Virtual particles.

For abstract, see NSA 29 07, number 16949.

IC-73/150 PC$3.00/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
AXIAL-VECTOR NUCLEON FORM FACTOR AND LOW-ENERGY PION ELECTROPRODUCTION.
G. Furlan, N. Paver, and C. Verzegnassi. Oct 73, 15p CONF-730580-1
U.S. Sales Only.

Descriptors: (*Pions plus, *Electroproduction), (*Nucleons, *Electromagnetic form factors), Threshold energy, Vectors.

For abstract, see NSA 29 07, number 17005.

IPNO-RC-73-5 PC$3.25/MF$1.45
Paris-11 Univ., 91 - Orsay (France). Inst. De Physique Nucleaire.
EXCITATION FUNCTIONS AND RECOIL RANGES OF RESIDUAL NUCLEI PRODUCED THROUGH KR INDUCED TRANSFER REACTIONS IN EXP 209 BI TARGETS.
R. Bimbot, and M. F. Rivet. 1973, 25p
U.S. Sales Only.

Descriptors: (*Krypton 84 reactions, *Transfer reactions), (*Bismuth 209, Krypton 84 reactions), (*Radon 210, *Nuclear reaction yield), (*Radon 211, Nuclear reaction yield), Astatine 211, Cross sections, Excitation functions, Ion beams, Krypton ions, Mev range 100-1000, Nuclear reaction kinetics, Recoils, Thallium 205.

For abstract, see NSA 29 07, number 17278.

JUL-971-MA PC$8.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Zentralinstitut fuer Angewandte Mathematik.
PROPERTIES OF CERTAIN INTEGRO-DIFFERENTIAL EQUATIONS OF THE BOLTZMANN TYPE IN LEBESGUE SPACES.
F. Ebersoldt. Jul 73, 117p
In German. U.S. Sales Only.

Descriptors: (*Neutron transport theory, *Boltzmann equation), Boundary conditions, Differential equations, Eigenvalues, Integral equations, Iterative methods, Mathematical space.

For abstract, see NSA 29 07, number 17091.

LA-5443-C PC$7.60/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
LECTURES FROM THE LAMPF SUMMER SCHOOL ON THE THEORY OF PION--NUCLEUS SCATTERING, JULY 23--26, 1973.
W. R. Gibbs, and B. F. V Gibson. Oct 73, 249p
CONF-730733-
Contract W-7405-eng-36

Descriptors: (*Pion reactions, *Lectures), Meetings.

For abstract, see NSA 29 07, number 17329.

LAL-1267 PC$12.50/MF$1.45
Paris-11 Univ., 91 - Orsay (France).
STUDY OF THE PHOTOPRODUCTION OF PI EXP - MESONS ON DEUTERONS IN THE REGION OF THE FIRST RESONANCE.
J. Boucrot. Jun 73, 207p
In French. U.S. Sales Only.

Descriptors: (*Photon-deuteron interactions, *Differential cross sections), (*Pions minus, *Photoproduction), (*Deuterium, *Photonuclear reactions), Gamma radiation, Neutrons, Photon-neutron interactions, Protons, Resonance.

For abstract, see NSA 29 07, number 16880.

LBL-2106 PC$4.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
SEARCH FOR POMERON--POMERON-2 PI EVENTS IN 205 GEV/C PI EXP - P INTERACTIONS.
D. M. Chew, G. S. Abrams, and H. H. Bingham. Aug 73, 23p
Contract W-7405-eng-48

Descriptors: (*Pion-proton interactions, *Pomeranchuk particles), Boundary conditions, Cross sections, Diagrams, Distribution, Exchange interactions, Gev range 100-1000, Linear momentum, Pions, Pions minus, Pions plus, Propagator, Regge poles.

For abstract, see NSA 29 07, number 16915.

LBL-2158 PC$4.50/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
MUON DEPOLARIZATION IN MATTER.
K. M. Crowe. Oct 73, 47p CONF-730849-1
Contract W-7405-eng-48

Descriptors: (*Muons, *Depolarization), Lectures, Matter.

For abstract, see NSA 29 07, number 16889.

LYCEN-7361 PC$3.00/MF$1.45
Lyon-1 Univ., 69 - Villeurbanne (France). Inst. De Physique Nucleaire.
SOME NUCLEAR MATTER CALCULATIONS WITH REALISTIC SEPARABLE NUCLEON--NUCLEON INTERACTIONS.
J. P. Meunier, J. Pigeon, and R. Nahabetian. Sep 73, 9p
U.S. Sales Only.

Descriptors: Binding energy, Brueckner method, Mass defect, Nonlocal potential, Nuclear matter, Nucleon-nucleon potential.

For abstract, see NSA 29 07, number 17344.

NP-19911 PC$3.00/MF$1.45
Imperial Coll. Of Science and Technology, London (Uk).
GETTING DOWN TO FUNDAMENTALS. THE PARTICLE SPECTRUM.
I. Butterworth. 1973, 20p
U.S. Sales Only.

Descriptors: (*Elementary particles, *Mass), Exotic resonances, Hypothesis, Interactions, Mathematical models, Matter, Particle properties, Particle structure, Quantum numbers, Quark model, Quarks, Spectra, Spin, Su-3 groups.

For abstract, see NSA 29 07, number 16928.

NP-19917 PC$4.00/MF$1.45
Rome Univ. (Italy). Istituto di Fisica; Istituto Nazionale di Fisica Nucleare, Rome (Italy).
SINGLE PHOTOPRODUCTION OF PI EXP - ON NEUTRONS IN DEUTERIUM IN THE REGION OF THE PION--NUCLEON RESONANCES P SUB 11 , D SUB 13 , AND S SUB 11 . NOTE NO. 418.
M. Beneventano, S. d'Angelo, F. de Notaristefani, P. Monacelli, and L. Paoluzi. 14 Dec 72, 38p
In Italian. U.S. Sales Only.

Descriptors: (*Pions minus, *Photoproduction), (*N*resonances, *Coupling), Deuterium, Dif-

ferential cross sections, Photon-neutron interactions, Polarization, Protons, Recoils.

For abstract, see NSA 29 07, number 16916.

N74-17427/7GA PC$13.00/MF$1.45
Paris Univ., Orsay (France). Lab. de l'Accelerateur Lineaire.
ANALYSIS OF FORM FACTORS OF THE DISINTEGRATIONS: POSITIVE KAON YIELDS PION POSITIVE MUON NEUTRION AND POSITIVE KAON YIELDS PION POSITRON NEUTRINO ANALYSE DES FACTEURS DE FORME DANS LES DESINTEGRATIONS KAON POSITIF PRODUIT PION MUON POSITIF NEUTRINO ET KAON POSITIF PRODUIT PION POSITRON NEUTRINO.
Ph.D. Thesis, 7 Jan. 1972.
L. Dong. Dec 71, 198p LAL-1255
Subm-Sponsored by Cnrs.
Language in French.

Descriptors: *Bubble chambers, *Data reduction, *Disintegration, *Form factors, *K-mesons, Hadrons, Monte carlo method, Pions, Spectrum analysis, U spin space.

For abstract, see STAR 1208

N74-17428/5GA PC$4.00/MF$1.45
Paris Univ., Orsay (France). Lab. de l'Accelerateur Lineaire.
MEASUREMENT OF DIFFERENTIAL CROSS SECTIONS OF PION AND KAON PRODUCTION ON ALUMINUM AND BERYLLIUM TARGETS AT 24 GEV/C MESURES DES SECTIONS EFFICACES DIFFERENTIELLES DE PRODUCTION DES MESONS PI ET K SUR CIBLE D'ALUMINIUM ET DE BERYLLIUM A 24 GEV/C.
B. Aubert, L. M. Chounet, and P. Heusse. Dec 71, 19p LAL-1259
Language in French.

Descriptors: *High energy interactions, *K-mesons, *Neutrinos, *Pions, *Scattering cross sections, Cerenkov counters, Data reduction, High dispersion spectrographs, International cooperation, Particle accelerator targets, Target thickness.

For abstract, see STAR 1208

N74-17429/3GA PC$4.25/MF$1.45
Paris Univ., Orsay (France). Lab. de l'Accelerateur Lineaire.
LIQUID DEUTERIUM TARGET CIBLE A DEUTERIUM LIQUIDE.
D. Blum, J. Boucrot, W. Mcgill, N. H. Nguyen, and B. Grossetete. May 72, 22p LAL-1263
In French; English Summary.

Descriptors: *Data acquisition, *Deuterium, *High energy interactions, *Liquidus, *Particle accelerator targets, Deuterons, Gamma rays, Photoproduction, Pions.

For abstract, see STAR 1208

N74-17431/9GA PC$4.00/MF$1.45
Paris Univ., Orsay (France). Lab. de L'Accelerateur Lineaire.
SOME EXPERIMENTAL EVIDENCE OF VIRTUAL COMPTON SCATTERING OBTAINED AT 990MEV WITH THE ORSAY STORAGE RING.
G. Cosme, B. Jean-marie, S. Jullian, F. Laplanche, and G. Parrour. Jul 73, 12p LAL-1268

Descriptors: *Annihilation reactions, *Compton effect, *High energy interactions, *Quantum electrodynamics, *Virtual properties, Data reduction, Gamma rays, Leptons, Scattering cross sections, Storage rings (Particle accelerators).

For abstract, see STAR 1208

N74-17432/7GA PC$4.00/MF$1.45
Paris Univ., Orsay (France).
ON A SIMPLE METHOD FOR MEASURING THE MOMENTS OF NEUTRAL PION MULTIPLICITY DISTRIBUTION.
D. Fournier, J. F. Rivaz, and J. J. Geillet. Sep 73, 14p LAL-1269

Descriptors: *Apexes, *Distribution moments, *Gamma rays, *High energy interactions, *Pion beams, Bremsstrahlung, Bubble chambers, Curve fitting, Data reduction, Monte carlo method, Poisson density functions, Polynomials, Probability distribution functions.

For abstract, see STAR 1208

N74-17433/5GA PC$11.50/MF$1.45
Paris Univ., Orsay (France). Lab. de l'Accelerateur Lineaire.
RADIOACTIVE DECAY OF NEUTRAL OMEGA AND NEUTRAL PHI VECTOR MESONS BY ELECTRON POSITRON ANNIHILATION ETUDE DES DESINTEGRATIONS RADIATIVES DES MESONS VECTORIELS OMEGA NEUTRE ET PHI NEUTRE PAR ANNIHILATION ELECTRON POSITRON.
Ph.D. Thesis.
G. Cosme. Apr 72, 169p LAL-1261
Language in French.

Descriptors: *Annihilation reactions, *Gamma rays, *Neutral particles, *Omega-mesons, *Radioactive decay, Data processing, Monte carlo method, Storage rings (Particle accelerators), U spin space, Vector dominance model.

For abstract, see STAR 1208

N74-17434/3GA PC$13.50/MF$1.45
Paris Univ., Orsay (France).
PHOTOPRODUCTION OF NEGATIVE PIONS ON DEUTERON IN THE FIRST RESONANCE REGION CONTRIBUTION A L'ETUDE DE LA PHOTOPRODUCTION DU PION NEGATIF SUR LE DEUTERON DANS LA REGION DE LA PREMIERE RESONANCE.
Ph.D. Thesis.
J. Boucrot. Jun 73, 207p LAL-1267
Language in French.

Descriptors: *Photoproduction, *Pions, *Proportional counters, *Scattering cross sections, *Spectrum analysis, Automation, Cdc 6600 computer, Computer programming, Correction, Data acquisition, Data reduction, Deuterons, Real time operation, Univac 1108 computer.

For abstract, see STAR 1208

ORNL-4806 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
NATURAL CHROMIUM AND EXP 52 CR NEUTRON ELASTIC AND INELASTIC SCATTERING CROSS SECTIONS FROM 4.07 TO 8.56 MEV.
W. E. Kinney, and F. G. Perey. Jan 74, 45p ENDF-198
Contract W-7405-eng-26

Descriptors: (*Chromium, Neutron reactions), (*Chromium 52, Neutron reactions), (*Neutron reactions, *Elastic scattering), Angular distribution, Differential cross sections, Energy levels, Excitation functions, Inelastic scattering, Mev range 01-10.

For abstract, see NSA 29 07, number 17189.

ORNL-4807 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
NATURAL NICKEL AND EXP 60 NI NEUTRON ELASTIC AND INELASTIC SCATTERING CROSS SECTIONS FROM 4.07 TO 8.56 MEV.
W. E. Kinney, and F. G. Perey. Jan 74, 39p ENDF-198
Contract W-7405-eng-26

Descriptors: (*Nickel, Neutron reactions), (*Nickel 60, *Energy levels), (*Neutron reactions, *Elastic scattering), (*Nickel 58, Energy levels), Angular distribution, Differential cross sections, Excitation functions, Inelastic scattering, Mev range 01-10.

For abstract, see NSA 29 07, number 17190.

ORNL-4933 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ENERGY DEPOSITION BY 45-GEV PHOTONS IN H, BE, AL, CU, AND TA.
R. G. Jr. Alsmiller, and J. Barish. Jan 74, 12p
Contract W-7405-eng-26

Descriptors: (*Hydrogen, *Photon transport), (*Beryllium, Photon transport), (*Aluminium, Photon transport), (*Copper, Photon transport), Bremsstrahlung, Energy losses, Gev range 10-100, Photons, Slabs, Tantalum.

For abstract, see NSA 29 07, number 17454.

ORO-2504-211 PC$3.50/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
DIFFERENTIAL CROSS SECTIONS FOR K EXP + P ELASTIC SCATTERING FROM 0.865 TO 2.125 GEV/C-DATA LISTING. TECHNICAL REPORT NO. 74-023.
K. Abe, B. A. Barnett, J. H. Goldman, A. T. Laasanen, and P. H. Steinberg. Sep 73, 27p

Descriptors: (*Kaon-proton interactions, *Elastic scattering), Differential cross sections, Gev range 01-10, Kaons plus, Linear momentum, Mev range 100-1000, Tables, Total cross sections.

For abstract, see NSA 29 07, number 16917.

ORO-2972-245 PC$15.75/MF$1.45
Texas Univ., Austin (Usa). Center for Nuclear Studies.
(RESEARCH IN NUCLEAR PHYSICS). ANNUAL REPORT, DECEMBER 1972--NOVEMBER 1973.
272p
Contract AT(40-1)-2972

Descriptors: (*Nuclear physics, *Research programs), Astrophysics, Atoms, Texas.

For abstract, see NSA 29 07, number 17205.

ORO-3992-151 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
NEW LOW ENERGY THEOREMS FOR GAMMA IMPLIES 3 PI AND GAMMA GAMMA IMPLIES 3 PI .
R. V. Mendes. 1973, 8p CPT-196

Descriptors: (*Photon-photon interactions, *Low-energy theorem), Pions, Scattering amplitudes.

For abstract, see NSA 29 07, number 16951.

ORO-3992-153 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
SPECTRAL SUM RULES BASED ON THE WILSON EXPANSION IN THE (3, ANTI 3) + (ANTI 3, 3) MODEL OF CHIRAL SYMMETRY.
P. R. Auvil, and N. G. Deshpande. 1973, 7p CPT-198
Contract AT(40-1)-3992

Descriptors: (*Chiral symmetry, *Sum rules), (*Eta-958 resonances, *Decay), (*Kaons, Decay), (*Pseudoscalar mesons, Sum rules), Pions, Symmetry breaking, Photons, Leptons, Neutrinos.

For abstract, see NSA 29 07, number 17037.

ORO-3992-160 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
CHIRAL SU(4) X SU(4) AND THE DECAY X IMPLIES N PI PI .
N. G. Deshpande, and D. A. Dicus. 1973, 14p CPT-204
Contract AT(40-1)-3992

Descriptors: (*Eta-958 resonances, *Decay), (*Su-4 groups, *Chiral symmetry), Eta mesons, Goldstone bosons, Pions, Symmetry breaking.

For abstract, see NSA 29 07, number 17038.

ORO-3992-78 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
CHARGE EXCHANGE AND HYPERCHARGE EXCHANGE PROCESSES IN THE (U(6) X U(6))/SUB BETA / ALGEBRA OF HADRON STRENGTHS.
Y. Ne'eman, and V. T. N. Reddy. 1972, 8p CPT-132

Descriptors: (*Hadron-hadron interactions, *Differential cross sections), Charge-exchange interactions, Hadrons, Hypercharge, U-6 groups.

For abstract, see NSA 29 07, number 17006.

ORO-4317-33 PC$3.00/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
MESON EXCHANGE EFFECTS ON THE CHARGE FORM FACTORS OF THE TRINUCLEON SYSTEM. TECHNICAL REPORT 74-043.
W. M. Kloet, and J. A. Tjon. Dec 73, 14p

Descriptors: (*Helium 3, *Form factors), Boson-exchange models, Bound state.

For abstract, see NSA 29 07, number 16952.

RL-73-130 PC$3.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
SIMPLE LOWER BOUND FOR THE PI EXP 0 PI EXP 0 TOTAL CROSS-SECTION.
F. P. Palou. Nov 73, 6p
U.S. Sales Only.

Descriptors: (*Pion-pion interactions, *Total cross sections), Boundary conditions, Interactions, Mathematical models, Pion beams, Pions neutral, S waves.

For abstract, see NSA 29 07, number 17007.

RLO-1388-666 PC$3.00/MF$1.45
Washington Univ., Seattle (Usa).
REGGEON CALCULUS VIEW OF DIFFRACTION SCATTERING.
J. N. Ng. 1973, 13p CONF-730837-12

Descriptors: (*Proton-proton interactions, *Elastic scattering), (*Regge calculus, Proton-proton interactions), Cross sections, Diffraction models, Pomeranchuk particles, Regge poles, Scattering, Total cross sections.

For abstract, see NSA 29 07, number 17018.

RLO-2041-101 PC$3.00/MF$1.45
Oregon Univ., Eugene (Usa).
COMMENTS ON DIFFRACTIVE PROCESSES.
R. C. Hwa. 1973, 19p CONF-730837-11

Descriptors: (*Particle interactions, *Diffraction models), Diagrams, Lectures.

For abstract, see NSA 29 07, number 16875.

RLO-2041-105 PC$3.00/MF$1.45
Oregon Univ., Eugene (Usa). Inst. Of Theoretical Science.
ANNUAL REPORT, 1973.
M. J. Moravcsik. 31 Oct 73, 7p
Contract AT(45-1)-2230

Descriptors: (*Particle interactions, *Research programs), Polarization.

For abstract, see NSA 29 07, number 16929.

RLO-2041-99 PC$3.00/MF$1.45
Oregon Univ., Eugene (Usa). Inst. Of Theoretical Science.
MULTIPLICITY SCALING IN THE NUMBER OF NEGATIVE SECONDARIES.
G. J. II Aubrecht, and E. M. Gordon. 1973, 7p
Contract AT(45-1)-2230

Descriptors: (*Kaon-proton interactions, *Scale invariance), (*Pion-proton interactions, Scale invariance), (*Proton-proton interactions, Scale invariance), Boundary conditions, Charged particles, Kaons minus, Kaons plus, Multiple production, Multiplicity, Particle production, Pions minus, Pions plus.

For abstract, see NSA 29 07, number 17013.

TID-3317-S4 PC$7.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
TRANSPLUTONIUM ELEMENTS. A BIBLIOGRAPHY.
C. E. Stuber. Jan 74, 215p

Descriptors: (*Transplutonium elements, *Bibliographies), (*Trans 104 elements, Bibliographies).

For abstract, see NSA 29 07, number 17299.

UCID-15849 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
TART MONTE CARLO CALCULATIONS OF 14.0 MEV NEUTRON TRANSPORT IN HOMOGENEOUS AIR.
E. F. Plechaty. May 71, 18p

Descriptors: (*Air, *Neutron transport), (*Fast neutrons, *Neutron fluence), Mev range 10-100, Monte carlo method, Point sources, Range.

For abstract, see NSA 29 07, number 17094.

UCID-16426 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
PROGRAM SIGMA1 (VERSION 74-1).
D. E. Cullen. Jan 74, 12p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *S codes), (*Doppler broadening, Computer codes), Cdc computers, Cross sections, Fortran, Ibm computers, Neutron reactions.

For abstract, see NSA 29 07, number 17095.

UCSC-34-P-197-X-2 PC$3.00/MF$1.45
California Univ., Santa Cruz (Usa).
PROGRESS REPORT.
25 Oct 73, 8p
Contract AT(04-3)-34

Descriptors: (*High energy physics, *Research programs).

For abstract, see NSA 29 07, number 16876.

20I. Plasma Physics

AD-776 349/3GA PC$8.75/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
MICROWAVE EXCITATION OF LASER GASES.
Master's thesis,
David R. Durham. Mar 74, 112p Rept no. GEP/PH/74-5

Descriptors: *Microwaves, *Gas ionization, Gas lasers, Excitation, Discharge, Plasmas(Physics), Metastable state, Theses, Afterglows, Electron density, Electrons, Nitrogen, Gases.
Identifiers: *Helium plasma, *Penning effect, Atom atom interactions, Atom electron interactions, Electron ion interactions.

The goal of this experiment was the creation of large numbers of electrons and helium (12 triplet S) metastables through the use of four microwave cavity discharges. The desire for gas ionization independent of the exciting field stems (1) from the increased efficiency available when lower exciting fields can be used, and (2) from the stabilizing effect of independent electron density control. The desire for helium metastable production stems from (1) additional electron creation via Penning ionization in a helium afterglow, and (2) increased metal-vapor laser pumping efficiency. The effective increase of the recombination coefficient due to electron cooling by added nitrogen was shown. The discovery of negative absorption of the 3889A line in a pure helium afterglow was made. (Modified author abstract)

AD-776 488/9GA Reprint
Cornell Univ Ithaca N Y Center for Applied Mathematics
ON THE INSTABILITY OF MAGNETOHYDRODYNAMIC COUETTE FLOW VIA NON-AXISYMMETRIC, OSCILLATORY CRITICAL MODES,
B. D. Hassard, T. S. Chang, and G. S. S. Ludford. 16 Nov 72, 12p AROD-5329.45-M
Grant DA-ARO-D-31-124-71-G163
Prepared in cooperation with North Carolina State Univ., Raleigh and Massachusetts Inst. of Tech., Cambridge.
Availability: Pub. in Plasma Physics, v15 p1235-1245 1973.

Descriptors: *Magnetohydrodynamics, *Couette flow, Partial differential equations, Instability.
Identifiers: Eigenvalues.

The onset of instability of MHD Couette flow due to non-axisymmetric, oscillatory disturbances is investigated. For counter-rotating cylinders, the authors discover the existence of two threshold magnetic fields. Below the first threshold, non-axisymmetric, oscillatory modes are responsible for the onset of instability in analogy with the hydrodynamic case. For values of the magnetic field between the two thresholds, the critical modes are axisymmetric and stationary. Beyond the second threshold, in the region of high magnetic field, the critical modes are again non-axisymmetric and oscillatory. For the case of a stationary inner cylinder, only the large magnetic threshold exists. For co-rotating cylinders, the authors verify the assumptions under which the exact solution was obtained by Hassard, Chang and Ludford. (Author)

AD-776 489/7GA Reprint
Texas Tech Univ Lubbock Dept of Electrical Engineering
CARBON DIOXIDE LASER BEAM REFRACTION IN A LINEAR DISCHARGE PLASMA,
G. M. Molen, M. Kristiansen, and M. O. Hagler. 17 Sep 73, 5p AFOSR-TR-74-0321
Grant AF-AFOSR-1757-69
Revision of report dated 17 May 73.
Availability: Pub. in Applied Physics Letters, v23 n11 p601-603, 1 Dec 73.

Descriptors: *Gas discharges, *Laser beams, *Refraction, Plasmas(Physics), Carbon dioxide lasers.
Identifiers: Geometric optics.

Beam guiding and focusing have been observed for CO2 laser propagation in a high-density low-temperature annular plasma. A TEA laser was fired along the axis of a cylindrical plasma column of densities in the 10 to the 16th power - 10 to the 17th power/cc range. Several radial density profiles were investigated. Beam guiding and focusing were observed when the density had a minimum on the axis. A density maximu on-axis refracted the beam toward the tube walls, and intense 'hot spots' resulting from apparent filamentation inside the plasma were recorded. (Author)

AD-776 800/5GA PC$4.75/MF$1.45
Wright State Univ Dayton Ohio
REAL TIME LANGMUIR PROBE DATA REDUCTION BY A MINICOMPUTER FOR A COLLISIONLESS PLASMA.
Interim technical rept. Mar 72-Mar 73,
John C. Corbin, Jr., Justin A. Curtis, Dennis F. Growjean, Merrill L. Andrews, and John S. Martin. Dec 73, 128p ARL-73-0114
Contract F33615-69-C-1842

Descriptors: *Plasmas(Physics), *Langmuir probes, Electron energy, Ion density, Confinement(Nuclear reactors), Data processing, Real time, Computer programs, Minicomputers, FORTRAN.
Identifiers: ELMAX devices.

A real time Langmuir probe data reduction program was developed and applied to a mirror geometry electrodynamic magnetoplasma experiment (ELMAX). The total program requires less than one minute to determine the electron temperature, ion density, and plasma and floating potentials at one position in the plasma. (Modified author abstract)

AD-776 826/0GA PC$4.00/MF$1.45
New York Univ N Y Courant Inst of Mathematical Sciences
MATHEMATICAL MODELS FOR PLASMAS.
Final rept.,
George Vahala, and Michael Mock. 1974, 5p
AFOSR-TR-74-0323
Grant AF-AFOSR-2499-73

Descriptors: *Plasmas(Physics), *Semiconductor devices, Mathematical models, Scientific research.

The paper presents studies of semi-conductors and of guiding center models.

AD-776 865/8GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
EFFECTS OF COLLISIONS ON THE DRIFT-CYCLOTRON INSTABILITY,
M. Y. Yu. 10 Jan 73, 5p AFOSR-TR-74-0402
Grant AF-AFOSR-2224-72
Prepared in cooperation with Umea Univ. (Sweden). Dept. of Plasma Physics.
Availability: Pub. in Physica Scripta, v8 p70-72 1973.

Descriptors: *Plasmas(Physics), Cyclotron resonance phenomena, Instability, Dispersion relations.
Identifiers: Fokker-Planck equation.

The effect of collisions on the drift-cyclotron instability in a plasma is considered by means of a model Fokker-Planck kinetic equation. The results are compared with those of other authors who used different collision models. It is shown that the growth rates of the instability obtained in the paper agree with those obtained iteratively from the full Fokker-Planck equation. (Author)

AD-776 916/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE THEORY OF STREAMER BREAKDOWN,
A. I. Zakharov, I. G. Iersyantsev, V. D. Pismennyi, A. V. Rodin, and A. N. Smarosmin. 11 Mar 74, 22p Rept no. FTD-HT-23-702-74
Edited trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n1 p56-65 1973, by Marilyn Olaechea.

Descriptors: *Gas ionization, *Electrical corona, Partial differential equations, Translations, USSR.
Identifiers: *Streamers.

In the present study the authors developed a qualitative theory to calculate the velocity of an anode-directed streamer in a case where the latter is independent of length. The stability of a streamer front in relation to infinitely small excitations is studied. It is shown that when a front of finite thickness is considered the streamer is stable. In an approximation for an infinitely thin leading front, the streamer is unstable.

CONF-720976-4 PC$5.50/MF$1.45
An Sssr, Moscow. Fizicheskij Inst.
NONLINEAR EFFECTS IN THE INTERACTIONS OF ELECTROMAGNETIC FIELDS WITH A COLLISIONLESS PLASMA.
I. R. Gekker. 1973, 67p
In Russian. U.S. Sales Only.

Descriptors: (*Collisionless plasma, *Electromagnetic fields), (*Plasma instability, *Parametric instabilities), Interactions, Laser radiation, Microwave radiation, Nonlinear problems, Plasma density.

For abstract, see NSA 29 07, number 17410.

COO-2288-4 PC$3.50/MF$1.45
Calspan Corp., Buffalo, N.Y. (Usa).
ABSORPTION OF ELECTROMAGNETIC WAVES NEAR THE CRITICAL DENSITY. ANNUAL REPORT, 1 DECEMBER 1972--30 NOVEMBER 1973.
J. W. Daiber, R. G. Rehm, and H. M. Thompson. 1973, 30p
Contract AT(11-1)-2288

Descriptors: (*Plasma, Laser radiation), (*Laser radiation, *Absorption), (*Plasma heating, *Laser-radiation heating), Hydrogen, Langmuir frequency, Plasma density, Reflection, Ruby, Scattering.

For abstract, see NSA 29 07, number 17383.

DNA-3175-F PC$4.00/MF$1.45
Science Applications, Inc., la Jolla, Calif. (Usa).
THEORETICAL STUDY OF NON-LTE PROCESSES IN LASER-HEATED PLASMAS. FINAL REPORT, 15 JUNE 1972--14 JUNE 1973.
S. Tamor. Oct 73, 6p

Descriptors: (*Plasma heating, *Laser-radiation heating), Computer codes, Excitation, Ionization, Neon, Plasma, X-ray spectra.

For abstract, see NSA 29 07, number 17384.

EUR-CEA-FC-678(Pt.2) PC$7.75/MF$1.45
Association Euratom-Cea, Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Groupe de Recherches sur la Fusion Controlee.
ANNUAL PROGRESS REPORT OF THE GRENOBLE RESEARCH GROUP, JANUARY 1 TO DECEMBER 31, 1972.
1972, 114p
In French. U.S. Sales Only.

Descriptors: (*Tokamak devices, *Magnetohydrodynamics), (*Plasma heating, *Ecr heating), Cea, Closed plasma devices, High-frequency heating, Hot plasma.

For abstract, see NSA 29 07, number 17385.

MATT-969 PC$3.00/MF$1.45
Princeton Univ., N.J. (Usa). Plasma Physics Lab.
RADIAL PROFILE OF PLASMA RESISTIVITY DETERMINED FROM AC IMPEDANCE MEASUREMENTS IN THE ST TOKAMAK.
A. N. Dellis, and J. C. Hosea. Dec 73, 15p
Contract AT(11-1)-3073

Descriptors: (*St tokamak, *Electric conductivity), (*Plasma, Electric conductivity), Electric currents, Electron density, Electron temperature, Impedance.

For abstract, see NSA 29 07, number 17402.

NP-19919 PC$3.00/MF$1.45
An Sssr, Moscow. Fizicheskij Inst.
PARAMETRIC EXCITATION OF WAVES IN MAGNETIZED PLASMA.
N. E. Andreev, G. M. Batanov, and K. A. Sarksyan. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma waves, *Excitation), Collisionless plasma, Electric fields, Electromagnetic radiation, Magnetic fields, Nonlinear problems, Parametric instabilities, Plasma.

For abstract, see NSA 29 07, number 17440.

NP-19920 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
ANOMALOUS ABSORPTION OF MICROWAVES BY PLASMA NEAR THE UPPER HYBRID FREQUENCY.
A. I. Anisimov, N. I. Vinogradov, and B. P. Poloskin. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma, *Microwave radiation), Absorption, Hybrid resonance, Ion acoustic waves, Magnetic fields, Plasma density, Toroidal configuration.

For abstract, see NSA 29 07, number 17441.

NP-19921 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
EXPERIMENTAL OBSERVATION OF A DECAY OF HIGH-FREQUENCY WAVES IN PLASMA.
A. I. Anisimov, N. I. Vinogradov, V. V. D'yachenko, and O. N. Shcherbinin. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma, *Electromagnetic radiation), Cyclotron frequency, Electric discharges, Electrons, Interactions, Ion acoustic waves, Ions, Toroidal configuration.

For abstract, see NSA 29 07, number 17442.

NP-19922 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
REGIONS OF THE SUPER-HIGH-FREQUENCY DISCHARGE IN DIFFERENT GASES FOR MAGNETIC FIELDS GREATER THAN THE CYCLOTRON FREQUENCY.
V. I. Arkhipenko, and V. N. Budnikov. 1973, 9p
In Russian. U.S. Sales Only.

Descriptors: (*Electric discharges, *Ionization), (*Argon, Electric discharges), (*Neon, Electric discharges), (*Hydrogen, Electric discharges), Langmuir frequency, Magnetic fields, Plasma, Plasma production.

For abstract, see NSA 29 07, number 17400.

NP-19923 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.

WAVE ABSORPTION BY TWO-DIMENSIONAL HETEROGENEOUS PLASMA NEAR SPECIAL POINTS.
V. I. Arkhipenko, V. N. Budnikov, and A. A. Obukhov. 1973, 14p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma, *Electromagnetic radiation), Absorption, Langmuir frequency, Magnetic fields, Two-dimensional calculations.

For abstract, see NSA 29 07, number 17443.

NP-19924 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
WAVE ABSORPTION BY PLASMA WITH NON-MONOTONIC LONGITUDINAL CONCENTRATION DISTRIBUTION.
V. I. Arkhipenko, V. N. Budnikov, and A. A. Obukhov. 1973, 14p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma, *Electromagnetic radiation), Absorption, Argon, Boundary conditions, Plasma density.

For abstract, see NSA 29 07, number 17444.

NP-19925 PC$3.25/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
SUPER-HIGH-FREQUENCY WAVE ABSORPTION BY PLASMA IN MAGNETIC FIELD FOR A SIGNIFICANT INFLUENCE OF THE LONGITUDINAL INHOMOGENEITY.
V. I. Arkhipenko, V. N. Budnikov, and A. A. Obukhov. 1973, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Inhomogeneous plasma, *Electromagnetic radiation), Absorption, Cyclotron frequency, Electrons, Ions, Magnetic fields.

For abstract, see NSA 29 07, number 17445.

NP-19926 PC$3.00/MF$1.45
An Sssr, Moscow. Fizicheskij Inst.
INTERACTION OF MICROWAVE RADIATION WITH A STREAM OF COLLISIONLESS PLASMA INSULATED FROM WAVEGUIDE WALLS.
V. I. Barinov, I. R. Gekker, V. A. Ivanov, and D. M. Karfidov. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Collisionless plasma, *Microwave radiation), Absorption, Carbon, Hydrogen, Interactions, Reflection, Waveguides.

For abstract, see NSA 29 07, number 17446.

NP-19928 PC$3.25/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
LONGITUDINAL THERMAL CONDUCTIVITY INFLUENCE ON THE OHMIC PLASMA HEATING IN "TUMAN-1".
M. G. Kaganskii, S. G. Kalmykov, and K. G. Shakhovets. 1973, 22p
In Russian. U.S. Sales Only.

Descriptors: (*Tuman devices, *Thermal conductivity), (*Plasma, Thermal conductivity), Electron temperature, Inhomogeneous fields, Joule heating, Magnetic fields, Plasma heating.

For abstract, see NSA 29 07, number 17396.

NP-19929 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
THRESHOLD OF DECAY INSTABILITY IN INHOMOGENEOUS PLASMA.
A. D. Piliya. 1973, 7p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma instability, *Parametric instabilities), Inhomogeneous plasma, Instability growth rates, Nonlinear problems, Plasma waves.

For abstract, see NSA 29 07, number 17411.

NP-19930 PC$3.00/MF$1.45
An Sssr, Leningrad. Fiziko-Tekhnicheskij Inst.
ELECTROMAGNETIC WAVE INTERACTION WITH PLASMA OF A TOROIDAL DISCHARGE.
I. P. Gladkovskii, V. E. Golant, V. V. D'yachenko, M. M. Larionov, and L. S. Levin. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Tokamak devices, *Joule heating), (*Plasma, *Electromagnetic radiation), Hybrid resonance, Interactions, Toroidal configuration.

For abstract, see NSA 29 07, number 17447.

N74-16957/4GA PC$8.25/MF$1.45
Commissariat a l'Energie Atomique, Villeneuve-Saint-Georges (France). Centre d'Etudes de Limeil.
CONTRIBUTION TO THE STUDY OF NON-CYLINDRICAL FOCUSED ELECTRICAL DISCHARGE.
Ph.D. Thesis - Paris Univ.
C. Patou. Sep 73, 124p CEA-R-4452
Language in French.

Descriptors: *Electric discharges, *Neutron emission, *X rays, Capacitors, Electron energy, Plasma dynamics, Thermonuclear reactions.

For abstract, see STAR 1208

N74-17442/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ITERATIVE METHODS FOR PLASMA SHEATH CALCULATIONS: APPLICATION TO SPHERICAL PROBE.
L. W. Parker, and E. C. Sullivan. Mar 73, 20p
NASA-TN-D-7409, G-7337

Descriptors: *Boundary value problems, *Electrostatic probes, *Plasma sheaths, Algorithms, Boltzmann-vlasov equation, Computer programs, Poisson equation.

For abstract, see STAR 1208

N74-17443/4GA PC$4.00/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
ABSORPTION OF THE MICROWAVE ENERGY IN A MAGNETOACTIVE PLASMA.
J. Musil, and F. Zacek. May 72, 16p IPPCZ-164

Descriptors: *Energy absorption, *Microwaves, *Plasmas (Physics), Cyclotron resonance, Magnetic fields, Magnetoactivity.

For abstract, see STAR 1208

N74-17444/2GA PC$4.00/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
THE ROLE OF LINEAR DAMPING FOR EXPLOSIVE INSTABILITIES.
K. Jungwirth. Feb 72, 14p IPPCZ-166

Descriptors: *Conservation laws, *Momentum theory, *Wave interaction, Damping, Electromagnetic fields, Energy transfer, Stability.

For abstract, see STAR 1208

N74-17445/9GA PC$4.50/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
PENETRATION OF HIGH-FREQUENCY WAVES INTO A WEAKLY INHOMOGENEOUS MAGNETIZED PLASMA AT OBLIQUE INCIDENCE AND THEIR TRANSFORMATION TO BERNSTEIN MODES.
J. Preinhaelter, and V. Kopecky. Sep 72, 29p IPPCZ-168

Descriptors: *Bernstein energy principle, *Density distribution, *Electromagnetic radiation, *Plasmas (Physics), *Wave propagation, High frequencies, Incidence, Plasma resonance.

For abstract, see STAR 1208

N74-17446/7GA PC$4.25/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
MICROWAVE HEATING OF ELECTRONS OF A DENSE PLASMA COLUMN AT FREQUENCIES HIGHER THAN ELECTRON CYCLOTRON FREQUENCY, PART 1.
J. Datlov, L. Kryska, and V. N. Budnikov. Sep 72, 21p IPPCZ-169-PT-1

Descriptors: *Cyclotron frequency, *Dense plasmas, *Microwave plasma probes, *Plasma frequencies, *Plasma heating, Electron density (Concentration), Harmonic excitation, Plasma waves.

For abstract, see STAR 1208

N74-17447/5GA PC$5.75/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
EFFECT OF TRAPPED BEAM ELECTRONS ON NONLINEAR BEAM-PLASMA INTERACTION.
K. Jungwirth, V. Piffl, and J. Ullschmied. Jun 72, 53p IPPCZ-165

Descriptors: *Electron beams, *Plasma-particle interactions, *Trapped particles, Cerenkov radiation, Excitation, Numerical analysis.

For abstract, see STAR 1208

N74-17448/3GA PC$10.00/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
THE BEHAVIOUR OF A WEAKLY IONIZED GAS IN CROSSED ELECTRIC AND MAGNETIC FIELDS. PART 1: DESCRIPTION OF WEAKLY IONIZED GAS FROM MACROSCOPIC VIEWPOINT (CONTINUUM THEORY).
P. Vrba. Nov 72, 140p IPPCZ-174-PT-1

Descriptors: *Electric fields, *Ionized gases, *Magnetic fields, Continuums, Dielectric properties, Electrodes, Plasma physics.

For abstract, see STAR 1208

N74-17449/1GA PC$6.50/MF$1.45
Institute of Plasma Physics, Prague (Czechoslovakia).
THE BEHAVIOUR OF A WEAKLY IONIZED GAS IN CROSSED ELECTRIC AND MAGNETIC FIELDS, PART 2.
P. Vrba. Nov 72, 70p IPPCZ-175-PT-2

Descriptors: *Electric fields, *Ionized gases, *Magnetic fields, Boltzmann transport equation, Distribution functions.

For abstract, see STAR 1208

N74-17450/9GA PC$3.00/MF$1.45
Institut Atomnoi Energii, Moscow (USSR).
CONDITIONS FOR OBTAINING A POSITIVE ENERGY BALANCE FOR A BETA EQUALS 1 PLASMA IN A TRAP WITH MAGNETIC MIRRORS.
A. V. Bortnikov, and N. N. Brevnov. 1972, 10p
IAE-2184
Language in Russian.

Descriptors: *Energy budgets, *Magnetic mirrors, *Plasma control, Electron beams, Lasers, Plasma heating.

For abstract, see STAR 1208

N74-17451/7GA PC$3.00/MF$1.45
United Kingdom Atomic Energy Authority, Culham (England).
THERMODYNAMIC STABILITY OF COLLISIONLESS PLASMAS.
E. Minardi. May 73, 7p CLM-R-124
Conf-Presented at Innsbruck Conf., 1-7 Apr. 1973.

Descriptors: *Collisionless plasmas, *Magnetohydrodynamic stability, *Thermodynamic properties, *Vlasov equations, Electrostatics, Plasma dynamics.

For abstract, see STAR 1208

N74-17452/5GA PC$3.25/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching (West Germany).
CONTINUOUS DROPLET SOURCE FOR PLASMA PRODUCTION WITH PULSE LASERS.
U. Schwenn, and R. Sigel. May 73, 23p IPP-4-47
In German; English Summary.

Descriptors: *Drops (Liquids), *Laser plasmas, *Pulsed lasers, Plasma generators, Water.

For abstract, see STAR 1208

N74-17453/3GA PC$3.50/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching (West Germany).
STOCHASTIC HEATING OF PLASMA ELECTRONS USING MICROWAVE.
S. Puri. Jun 73, 30p IPP-4-57

Descriptors: *Microwave frequencies, *Plasma heating, *Stochastic processes, Afterglows, Bandwidth, Magnetohydrodynamic stability.

For abstract, see STAR 1208

N74-17457/4GA PC$4.25/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
POLARIZATION MEASUREMENT ON SPECTRAL LINES OF LOW INTENSITY AND SHORT DURATION.
L. Danielsson, and L. Lindberg. Oct 73, 22p
TRITA-EPP-73-17

Descriptors: *Electron distribution, *Line spectra, *Plasma radiation, *Polarization characteristics, *Velocity distribution, Equipment specifications, Helium, Light sources, Magnetic fields.

For abstract, see STAR 1208

N74-17458/2GA PC$4.00/MF$1.45
Fom-Instituut voor Plasmafysica, Jutphaas (Netherlands).
MICROWAVE INTERFEROMETER WITH DIGITAL READ-OUT FOR LARGE NUMBERS OF FRINGES.
C. A. J. Hugenholtz, and A. J. Putter. Sep 73, 9p
REPT-73-81
Subm-Sponsored in Part by Neth. Organ. For Pure Sci. Res. (Zwo) and Euratom.

Descriptors: *Diffraction patterns, *Digital techniques, *Microwave interferometers, *Readout, Counters, Dense plasmas, Plasma diagnostics, Tokamak fusion reactors.

For abstract, see STAR 1208

N74-17459/0GA PC$4.00/MF$1.45
Fom-Instituut voor Plasmafysica, Jutphaas (Netherlands).
IDEAL MHD-EQUILIBRIUM OF A TOROIDAL FORCE-FREE PLASMA IN A TRKAL FIELD UP TO THIRD ORDER IN THE INVERSE ASPECT RATIO.
W. Schuurman. Jul 73, 12p REPT-73-79
Subm-Sponsored in Part by Neth. Organ. For Pure Sci. Res. (Zwo), and Euratom.

Descriptors: *Equilibrium flow, *Force-free magnetic fields, *Magnetohydrodynamic stability, *Toroidal plasmas, Aspect ratio, Current density, Magnetic flux, Plasma pinch, Tokamak fusion reactors.

For abstract, see STAR 1208

N74-17460/8GA PC$4.00/MF$1.45
Fom-Instituut voor Plasmafysica, Jutphaas (Netherlands).
MHD-EQUILIBRIUM OF A BELT-SHAPED PLASMA IN A TRKAL FIELD.
J. A. Hoekzema, and W. Schuurman. Jul 73, 19p
REPT-73-78
Subm-Sponsored in Part by Neth. Organ. For Pure Sci. Res. (Zwo), and Euratom.

Descriptors: *Equilibrium flow, *Magnetohydrodynamic stability, *Plasma cylinders, Force-free magnetic fields, Plasma pinch, Tokamak fusion reactors, Trapped magnetic fields.

For abstract, see STAR 1208

N74-17461/6GA PC$7.75/MF$1.45
Fom-Instituut voor Plasmafysica, Jutphaas (Netherlands).
EXPERIMENTAL STUDY OF ION HEATING BY WAVE MIXING IN AN ELECTRON-CYCLOTRON-RESONANCE PLASMA.
Ph.D. Thesis - Utrecht Univ.
L. C. J. M. Dekock. Sep 73, 93p REPT-73-80
Subm-Sponsored in Part by Neth. Organ. For Pure Sci. Res. (Zwo), and Euratom.

Descriptors: *Cyclotron resonance, *Electron plasma, *Plasma heating, *Plasma-electromagnetic interaction, Electromagnetic radiation, Ion cyclotron radiation, Plasma control.

For abstract, see STAR 1208

ORO-3393-10 PC$3.00/MF$1.45
Maryland Univ., College Park (Usa).
APPLICATIONS OF LIGHT SCATTERING TO PLASMA DIAGNOSTICS. PROGRESS REPORT, APRIL 1972--MARCH 1973.
1973, 5p
Contract AT(40-1)-3393

Descriptors: (*Plasma diagnostics, *Laser radiation), (*Theta pinch, Plasma diagnostics), Electric probes, Ion density, Ion temperature, Plasma heating, Scattering, Spectra.

For abstract, see NSA 29 07, number 17393.

UCB-34-P-128-22 PC$4.25/MF$1.45
California Univ., Berkeley (Usa). Electronics Research Lab.
SECOND SEMIANNUAL PROGRESS REPORT OF 1972 ON PLASMA RESEARCH, 1 JULY--31 DECEMBER 1972.
1972, 44p
Contract AT(04-3)-34

Descriptors: (*Plasma, *Research programs), (*Plasma heating, *Ecr heating), (*Magnetic mirrors, Ecr heating), Computer calculations, Electron beams, Lithium, Modulation, Power supplies.

For abstract, see NSA 29 07, number 17386.

UCI-34-P-207-X-1 PC$8.00/MF$1.45
California Univ., Irvine (Usa).
STUDY OF PLASMA HEATING BY INTENSE RELATIVISTIC ELECTRON BEAMS. PROGRESS REPORT, MARCH 31, 1973--SEPTEMBER 30, 1973.
N. Rostoker, and N. Rynn. Oct 73, 118p
Contract AT(04-3)-34

Descriptors: (*Plasma heating, *Electron beams), Beam currents, Cusped geometries, Ion temperature, Magnetic mirrors, Relativistic beam injection, Rotation.

For abstract, see NSA 29 07, number 17387.

UCID-16425 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
INVERSE BREMSSTRAHLUNG ABSORPTION COEFFICIENT AND INITIATION OF LASER-SUPPORTED DETONATION WAVES IN AIR.
A. M. Winslow. 6 Dec 73, 18p
Contract W-7405-eng-48

Descriptors: (*Laser-produced plasma, Bremsstrahlung), (*Bremsstrahlung, *Computer codes), Absorption, Air, L codes, Shock waves, Solids, Targets.

For abstract, see NSA 29 07, number 17406.

UCLA-34-P-157-X-7 PC$5.00/MF$1.45
California Univ., Los Angeles (Usa).
JOINT EXPERIMENTAL-THEORETICAL PROGRAM IN PLASMA HEATING AND CONTROL. (PROGRESS REPORT, 1973).
1973, 58p
Contract AT(11-1)-34

Descriptors: (*Plasma simulation, *Research programs), (*Laser-produced plasma, Research programs), (*Plasma heating, *Laser-radiation heating), Computer calculations, Lasers, Planning, Plasma.

For abstract, see NSA 29 07, number 17388.

UCRL-75167 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
THEORETICAL DESCRIPTION OF PULSED LASER-TARGET INTERACTION IN AN AIR ENVIRONMENT.
A. Edwards, N. M. Ferriter, J. A. Jr. Fleck, and A. M. Winslow. 24 Oct 73, 37p CONF-731049-1

Descriptors: (*Laser-produced plasma, *Two-dimensional calculations), (*Plasma heating, *Laser-radiation heating), Air, Laser radiation, Plasma, Shock waves, Targets, Thermal conductivity.

For abstract, see NSA 29 07, number 17407.

20J. Quantum Theory

AD-776 408/7GA PC$5.00/MF$1.45
Tel-Aviv Univ (Israel)
GENERALIZED APPROXIMATIVE PROCEDURES IN THE MANY BODY PROBLEM.
Final technical rept.,
I. Kelson. Nov 73, 39p
Contract DAJA37-72-C-4532

Descriptors: *N body problem, *Wave functions, Combinatorial analysis, Hartree-Fock approximation, Tensor analysis, Numerical integration, Approximation, Israel.
Identifiers: Variational methods.

Properties of muktiparticle spaces are investigated, which are common to diverse physical systems. Special emphasis is placed on the concept of independent particle motion and the mathematical tools relevant to its use. The concept of determinantal measure is introduced and

discussed, and a procedure for calculating its space average is followed in some simple cases. Approximate methods for evaluating it in general are developed, studying combinational structural aspects of the single particle description. Generalized variational principles are briefly considered, and technical aspects of their application are qualitatively analyzed. (Author)

AD-776 527/4GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
NONRELATIVISTIC FORMULATION OF THE PROBLEM OF N BODIES,
I. T. Obukhovskyi. 2 Jan 74, 13p Rept no. FSTC-HT-23-391-72
Trans. of Moscow Univ. Vestnik (USSR) n4 p42-61 Jul/Aug 69.

Descriptors: *N body problem, *Green's function, Quantum theory, Topology, Translations, USSR.

A new generalization of Faddeev's equation is obtained, which is different from Yakubovskiy's generalization. The difference is due to utilizing four-dimensional theory instead of three-dimensional theory. An appropriate four-dimensional operator technique is constructed which facilitates the derivation of equations which are similar to the diagram equations of Komarov and Popova. A topological analysis of the amplitudes is made by using structural diagrams.

NP-19915 PC$3.25/MF$1.45
Imperial Coll. Of Science and Technology, London (Uk).
TIME, GRAVITATION, AND THE UNIVERSE: THE EVOLUTION OF RELATIVISTIC THEORIES.
G. J. Whitrow. 1973, 24p
U.S. Sales Only.

Descriptors: (*General relativity theory, *Reviews), (*Electrodynamics, Reviews), (*Cosmology, Reviews), (*Gravitation, Reviews), Blackbody radiation, Classical mechanics, Lorentz transformations, Maxwell equations, Minkowski space, Radar, Relativity theory, Riemann space, Time dependence, Universe.

For abstract, see NSA 29 07, number 17526.

ORO-3992-156 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
IMPLICATIONS OF THE SHADOW EFFECT IN THEORIES OF GRAVITATION.
C. C. Chiang, J. J. Dykla, and A. E. Hwang. 1973, 14p CPT-200
Contract AT(40-1)-3992

Descriptors: Distribution, Einstein field equations, General relativity theory, Gravitation, Mass, Singularity, Tensors.

For abstract, see NSA 29 07, number 17527.

ORO-3992-157 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
COVARIANT THEORY OF MAGNETIC MONOPOLE.
C. C. Chiang. 1973, 16p CPT-201

Descriptors: (*Magnetic monopoles, *Lorentz transformations), Commutation relations, Electromagnetic fields, Quantum field theory.

For abstract, see NSA 29 07, number 17501.

ORO-3992-158 PC$3.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
THEORY OF MASSIVE AND MASSLESS YANG--MILLS FIELDS.
J. P. Hsu, and E. C. G. Sudarshan. 1973, 16p CPT-202

Descriptors: Feynman diagram, Field equations, Lagrangian function, Mass, Renormalization, Unitarity, Yang-mills theory.

For abstract, see NSA 29 07, number 17502.

20K. Solid Mechanics

AD-776 351/9GA PC$7.50/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Dept of Mechanical Engineering
AN IMPROVED IMPLEMENTATION OF THE BOUNDARY-INTEGRAL TECHNIQUE FOR TWO DIMENSIONAL ELASTICITY PROBLEMS,
P. C. Riccardella. Sep 72, 87p Rept no. SM-72-26
Grant DA-ARO-D-31-124-72-G3

Descriptors: *Boundary value problems, *Elastic properties, Two dimensional, Integral equations, Crack propagation, Stresses, Computer programming.

A new implementation of the boundary-integral technique for two-dimensional elasticity problems is developed. The new approach uses linear variation of boundary tractions and displacements over straight line boundary segments. A significant improvement in the numerical accuracy of the boundary-integral technique is demonstrated. (Author)

AD-776 433/5GA Reprint
California Inst of Tech Pasadena
BUCKLING OF COMPLETE SPHERICAL SHELLS UNDER SLIGHTLY NONUNIFORM LOADS,
Herbert B. Keller. 1973, 23p AROD-7625.28-M
Contract DAHC04-68-C-0006
Availability: Pub. in Nonlinear Elasticity, p229-250 1973.

Descriptors: *Buckling, *Shells(Structural forms), *Loads(Forces), Elastic properties, Deformation.
Identifiers: *Spherical shells.

The author studies the axisymmetric deformations of a complete (thin) spherical shell subject to external loads of the form p(theta) = (p sub 0) + tau d(theta). Here theta is the latitude and tau measures the deviation of the load from a uniform pressure, (p sub 0). The purpose of the study is twofold. First, since there is considerable technical interest in the effects that various kinds of imperfections have on buckling loads the author solves the indicated problem and shows that the effects are very similar to those caused by small initial deviations from the exact spherical shape. Secondly, the techniques for solving this and a broad class of related problems are quite new and particularly relevant in elasticity theory. (Modified author abstract)

AD-776 434/3GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
ELASTIC WAVES PRODUCED BY SURFACE DISPLACEMENTS,
Daljit S. Ahluwalia, Joseph B. Keller, and Richard Jarvis. 22 Aug 72, 14p AFOSR-TR-74-0324
Grant AF-AFOSR-2107-71
Availability: Pub. in Jnl. on Applied Mathematics, v26 n1 p108-119 Jan 74.

Descriptors: *Elastic waves, *Diffraction analysis, Boundary value problems.
Identifiers: Geometrical acoustics, Geometrical diffraction theory.

Waves produced in a homogeneous elastic body by time-dependent displacements of all or part of the body surface are determined by the geometrical theory of diffraction. Waves associated with the rays of geometrical acoustics, and with certain diffracted rays, are treated. The latter arise from curves of discontinuity of the applied displacement and from curves separating the displaced part of the surface from the free part. The expression for each type of diffracted wave contains a diffraction coefficient. Certain diffraction coefficients are determined from appropriate canonical problems which are solved exactly by the conical field method. The theory is applied to the impulsive and time-harmonic angular displacements of a circular region on the otherwise stress free surface of a half-space. The results are shown to agree with and extend those found previously in these cases by other methods. (Author)

AD-776 440/0GA Reprint
Brown Univ Providence R I Dept of Engineering
ON OPTIMALITY CONDITIONS FOR TRUSSES WITH NONUNIFORM STRESS CONSTRAINTS,
G. A. Gunnlaugsson, and J. B. Martin. 13 Nov 72, 17p AROD-8334.23-E
Grant DA-ARO-D-31-124-71-G41
Availability: Pub. in Structural Mechanics, v2 n3 p195-209 1973.

Descriptors: *Trusses, *Stresses, Linear programming, Optimization.
Identifiers: Structural design, Variational methods.

The optimal design of a truss subjected to a single loading system and stress constraints, which are not necessarily the same in each bar, is considered. Sufficient conditions for global optimality are derived by variational methods. While these optimality criteria lead to a linear programming formulation of the problem, they show in a clear physical way how the optimal design is found, and that advantages accrue from incorportating the optimality criteria in a numerical scheme. (Author)

AD-776 463/2GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
NONUNIQUENESS OF EQUILIBRIUM STATES FOR BARS IN TENSION,
Stuart S. Antman. 1973, 19p AFOSR-TR-74-0325
Grant AF-AFOSR-2013-71
Availability: Pub. in Jnl. of Mathematical Analysis and Applications, v44 n2 p333-349 Nov 73.

Descriptors: *Rods, *Deformation, Boundary value problems.
Identifiers: Bifunction theory.

It is well known that the solutions of the equilibrium equations for bars under compression need not be unique. In the paper the author proves that there can likewise be a multiplicity of solutions for bars in tension. For this purpose a general nonlinear one-dimensional theory of rods is used having sufficient kinematic structure to account for transverse deformation.

AD-776 472/3GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Mathematics
DUAL EXTREMUM PRINCIPLES RELATING TO OPTIMUM BEAM DESIGN,
S. Bhargava, and R. J. Duffin. 20 Sep 72, 19p AROD-9300.11-M
Grant DA-ARO-D-31-124-71-G17
Availability: Pub. in Archive for Rational Mechanics and Analysis, v50 n4 p314-330 1973.

Descriptors: *Cantilever beams, Loads(Forces), Optimization.
Identifiers: Design.

Of concern is a cantilever beam resting on an elastic foundation and supporting a load at the free end. The beam is of rectangular cross section and of constant height but variable width. It is required to taper the beam for maximum strength. This means that the beam is to support a maximum vertical load W at the free end when the free end is

given unit deflection. The constraint is that the weight of the beam should not exceed a given bound K. It is shown that the optimum taper should be so chosen that the curvature of the beam is constant. This yields the solution of the problem in terms of explicit formulas. For more general constraints, an inequality is found which gives upper and lower bounds for the maximum load W even though explicit formulas are not available. (Author)

AD-776 498/8GA Reprint
Pennsylvania State Univ University Park Dept of Engineering Mechanics
A FINITE DEFORMATION THEORY OF PLASTICITY,
H. T. Hahn. 2 Jul 73, 12p AFOSR-TR-74-0298
Grant AF-AFOSR-1626-69
Revision of report dated 5 Mar 73.
Availability: Pub. in International Jnl. Solids Structures, v10 n1 p111-121 1974.

Descriptors: *Plastic deformation, Stresses, Tensor analysis.

Based on a multiplicative decomposition of local deformation into elastic and plastic deformations general constitutive equations of elastic-plastic materials are proposed. Two alternative approaches are discussed: one in which the elastic deformation is used as an independent variable, and the other in which the stress is one of the independent variables. The appropriate material symmetries are defined, and it is shown that the plastic spin is absent in the theory of isotropic materials. Analysis of a simple extension is given as an example. (Author)

AD-776 519/1GA Reprint
Illinois Univ Chicago
ON WAVE PROPAGATION PROBLEMS IN WHICH C SUB F = C SUB S = C SUB 2 OCCURS,
T. C. T. Ting. 7 Jun 72, 14p AROD-10016.1-E
Grant DA-ARO-D-31-124-72-G87
Availability: Pub. in Quarterly of Applied Mathematics, p275-286 Oct 73.

Descriptors: *Stresses, *Stress wave, *Elastic properties, Partial differential equations, Matrices(Mathematics), Numerical integration.

The combined longitudinal and torsional plastic waves in a thin-walled tube of rate-independent isotropic work-hardening material are used to illustrate the problems involved when the situation (c sub f) = (c sub s) = (c sub 2) occurs. Two examples are presented. (Modified author abstract)

AD-776 641/3GA PC$3.25/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
OPTIMUM DESIGN OF RING STIFFENED CYLINDRICAL SHELLS,
Allen J. Bronowicki, Richard B. Nelson, Lewis P. Felton, and Lucien A. Schmit, Jr. Feb 74, 33p Rept no. UCLA-ENG-7414
Contract N00014-69-A-0200-4048

Descriptors: *Shells(Structural forms), *Ring stiffened cylinders, *Structural properties, Loads(Forces), Buckling, Structural response, Stresses, Partial differential equations.
Identifiers: *Structural design, *Cylindrical shells.

The report deals with the optimum structural design of circular cylindrical shells reinforced with identical uniformly spaced T-ring stiffeners, and subjected to external pressure loading. The optimization problems considered are of three types: (1) minimum-weight design, (2) design for maximum separation of the lowest two natural frequencies, and (3) design for maximum separation of the lowest two natural frequencies which have primarily axial content. Gross buckling is precluded by specifying a minimum natural frequency, and additional behavioral constraints preclude yielding or buckling of panels, T-ring stiffeners, and web and flange instabilities within each T-ring. Analysis is based on use of an equivalent orthotropic shell model, and optimization is accomplished through use of a sequential unconstrained minimization technique. (Modified author abstract)

AD-776 729/6GA PC$4.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
LARGE BENDS OF ORTHOTROPIC PANELS; RECTANGULAR IN PLAN-VIEW,
Z. M. Pekerman, and K. Z. Galimov. 7 Mar 74, 23p Rept no. FTD-HT-23-347-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n9 p228-246 1972, by Kathleen L. Dion.

Descriptors: *Panels, *Bending stress, Loads(Forces), Deformation, Translations, USSR, Shells(Structural forms).

The article considers the problem of determining large bends of a shallow orthotropic shell, rectangular in plan-view and loaded by a uniform external pressure and axial compression with different means of fastening the bearing contour.

AD-776 732/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THEORY OF PLATES OF AVERAGE THICKNESS,
Yu. I. Butenko, and A. I. Kutikov. 21 Mar 74, 16p Rept no. FTD-HT-23-354-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n9 p419-431 1972, by Rene Courville.

Descriptors: *Plates, *Stresses, *Deformation, Elastic properties, Partial differential equations, Numerical integration, Translations, USSR.

AD-776 736/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NONAXISYMMETRIC STABILITY LOSSES IN CONICAL SHELLS UNDER THE EFFECT OF EXTERNAL PRESSURE,
E. I. Grigolyuk, and V. P. Maltsev. 11 Mar 74, 5p Rept no. FTD-HT-23-910-74
Edited trans. of Nauchnaya Konferentsiya, Institut Mekhaniki MGU, n.p., 1970. Tezisy Dokadov, n.p., n.d., p23-24, by Kathleen L. Dion.

Descriptors: *Shells(Structural forms), *Loads(Forces), Stress strain relations, Translations, USSR.
Identifiers: *Conical shells, Stability methods.

Based on linear theory of shallow shells, two universal numerical algorithms are given in order to study the stability of conical shells under arbitrary boundary conditions and taking into consideration structural orthotropy, moments and nonlinearity in the subcritical state, and also axisymmetric initial deflections. The axisymmetric load can vary along the generatrix according to any law. The proposed method of studying stability makes it possible to determine not only the critical loads, but also the parameters of the stress-strain state with stability failure.

AD-776 754/4GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
LARGE BENDS IN PLATES RECTANGULAR IN PLAN-VIEW AND IN SHALLOW SHELLS MADE OF NONLINEARLY ELASTIC MATERIAL,
M. S. Kornishin, N. N. Stolyarov, and N. I. Dedov. 7 Mar 74, 17p Rept no. FTD-HT-23-343-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n9 p157-168 1972, by Kathleen L. Dion.

Descriptors: *Plates, *Bending stress, *Shells(Structural forms), Deformation, Elastic properties, Translations, USSR.

AD-776 774/2GA PC$4.00/MF$1.45
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
OPTIMIZATION OF STRUCTURES FOR STRENGTH AND STABILITY REQUIREMENTS.
Final rept. Jun 72-Apr 73,
Narendra S. Khot, Vipperla B. Venkayya, and Laszlo Berke. Dec 73, 76p Rept no. AFFDL-TR-73-98

Descriptors: *Structural members, *Buckling, Loads(Forces), Stresses, Trusses, Numerical analysis.
Identifiers: Finite element analysis, Stability methods, Structural design.

An optimization method for minimum weight design of structures with static stability requirements is presented. The stability requirement is defined as a stiffness constraint and it is measured by the Rayleigh quotient. An optimality criterion is derived by the minimization procedure using a Lagrangian multiplier. A recursion relation for achieving the optimality ciriterion is also derived. The method is explained in the context of the displacement method of finite element analysis and the linear buckling load is determined by eigenvalue solution. The method is programmed for design of bar and beam structures. Designs are presented for columns with various end fixities, rectangular frames, and two and three dimensional bar structures. The proposed method is suitable for designing practical structures with a large number of design variables. (Author)

AD-776 797/3GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
PRINCIPLE OF DYNAMIC EQUIPOLLENCY AND THE LIMITATIONS OF THE INVERSE EIGENVALUE METHOD OF MECHANICAL ADMITTANCE ANALYSIS.
Technical note,
Ronald L. Bagley. 4 Mar 74, 36p Rept no. TN-1974-17 ESD-TR-74-46
Contract F19628-73-C-0002

Descriptors: *Structural response, *Admittance, *Loads(Forces), Matrices(Mathematics), Eigenvectors, Resonant frequency.
Identifiers: Eigenvalues, Inverse eigenvalue method, Matrix methods.

Limitations on the practical application of the inverse eigenvalue method are discussed. The principle of dynamic equipollency, which is derived and related to the limitations of the inverse eigenvalue method, makes possible an efficient method of dealing with a structure having many degrees of freedom. It is also shown that moment-rotational velocity impedances can be generated experimentally using the principle of dynamic equipollency. (Author)

AD-776 892/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROBLEM OF USING THE METHOD OF FINITE ELEMENTS TO CONSTRUCT AN ALGORITHM FOR CALCULATING A THIN-WALLED REINFORCED SHELL OF AN EXTREMELY IRREGULAR NATURE AND ADAPTING THIS PROBLEM TO THE ELECTRONIC DIGITAL COMPUTER,
Z. I. Burman. 8 Mar 74, 25p Rept no. FTD-HT-23-359-74
Edited trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n8 p200-215 1972, by Marilyn Olnechea.

Descriptors: *Shells(Structural forms), *Loads(Forces), Computer applications,

Matrices(Mathematics), Algorithms, Translations, USSR.
Identifiers: Finite element analysis, Matrix methods.

N74-17601/7GA PC$4.00/MF$1.45
South Dakota State Univ., Brookings. Dept. of Mechanical Engineering.
PRIOR-TO-FAILURE EXTENSION OF FLAWS UNDER MONOTONIC AND PULSATING LOADINGS: INELASTIC FATIGUE.
Annual Progress Report.
M. P. Wnuk. May 71, 40p NASA-CR-132399
Contract NGR-42-003-006

Descriptors: *Crack propagation, *Fatigue (Materials), *Loads (Forces), Differential equations, Failure modes, Numerical integration, Stress concentration.

For abstract, see STAR 1208

N74-17613/2GA PC$5.25/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Mechanics.
THERMOELASTIC STABILITY OF LAMINATED ORTHOTROPIC CIRCULAR PLATES.
Y. Stavsky. Dec 73, 43p TDM-73-33

Descriptors: *Circular plates, *Structural stability, *Thermal buckling, *Thermoelasticity, Composite materials, Differential equations, Eigenvalues, Loads (Forces).

For abstract, see STAR 1208

N74-17614/0GA PC$4.50/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Coll. of Engineering.
STRESS INTENSITY FACTORS FOR DEEP CRACKS EMANATING FROM THE CORNER FORMED BY A HOLE INTERSECTING A PLATE SURFACE.
Technical Report, Fall 1972 - Fall 1973.
J. J. Mcgowan, and C. W. Smith. Jan 74, 28p
NASA-CR-136930, VPI-E-74-1
Contract NGR-47-004-476

Descriptors: *Crack propagation, *Hole distribution (Mechanics), *Stress analysis, *Stress concentration, Fracture mechanics, Numerical analysis, Photoelastic analysis.

For abstract, see STAR 1208

N74-17615/7GA PC$4.75/MF$1.45
Space Science and Technology Centre, Trivandrum (India). Structural Engineering Div.
RESPONSE OF STRUCTURES TO RANDOM ACOUSTIC EXCITATION: AN EXPERIMENTAL STUDY.
B. R. Bhat, B. V. A. Rao, and H. Wagner. 6 Nov 73, 34p
Subm-Backup Document for Aiaa Synoptic Scheduled for Publication in the Journal of Spacecraft and Rockets in Apr. 1974.

Descriptors: *Dynamic structural analysis, *Flat plates, *Power spectra, *Structural stability, Acoustic excitation, Autocorrelation, Dynamic response, Numerical analysis, Random loads.

For abstract, see STAR 1208

PB-230 353/5GA PC$12.50/MF$1.45
California Univ., Berkeley. Structural Engineering Lab.
EXTENSION OF THREE DIMENSIONAL ANALYSIS TO SHELL STRUCTURES USING THE FINITE ELEMENT IDEALIZATION.
Henry H. Dovey. Jan 74, 186p UCSESM-74-2

Descriptors: *Shells(Structural forms), *Structural analysis, Boundary value problems, Numerical integration, Computer programs, Stiffness methods, Partial differential equations, Stresses.
Identifiers: *Finite element analysis, Variational methods.

A three dimensional finite element which is appropriate for use in general shell applications is presented. It is shown that a simple recasting of the element formulation which introduces relative displacements eliminates problems of numerical sensitivity which arise when using standard three dimensional elements in thin shell applications. A technique of incorporating geometric constraints on the permissible displacements of individual nodes is demonstrated. (Modified author abstract)

PB-231 112/4GA PC$5.00/MF$1.45
California Univ., Berkeley. Structural Engineering Lab.
NONSAP: A STRUCTURAL ANALYSIS PROGRAM FOR STATIC AND DYNAMIC RESPONSE OF NONLINEAR SYSTEMS,
Klaus-Jurgen Bathe, Edward L. Wilson, and Robert H. Iding. Feb 74, 172p UCSESM-74-3

Descriptors: *Dynamic structural analysis, *Static structural analysis, Computer programming, Programming manuals, Nonlinear systems, Matrix methods, Control sequences.
Identifiers: NONSAP computer program, Finite element analysis.

The current version of the computer program NONSAP for linear and nonlinear, static and dynamic finite element analysis is described. The solution capabilities, the numerical techniques used, the finite element library, the logical construction of the program and storage allocations are discussed. The user's manual of the program is given. Some sample solutions are included, which are standard data cases available with the program. (Author)

20L. Solid-State Physics

AD-776 411/1GA PC$3.00/MF$1.45
Kansas Univ Lawrence Dept of Physics
EXPERIMENTAL AND THEORETICAL STUDIES OF MAGNETIC RESONANCE AND RELAXATION WITH EMPHASES ON ONE DIMENSIONAL MAGNETISM.
Final rept. 1 Jun 70-30 Nov 73,
Jack W. Culvahouse, and Peter M. Richards. 8 Mar 74, 8p AROD-8949:3-P
Grant DA-ARO-D-31-124-70-G74

Descriptors: *Magnetic materials, *Magnetic resonance, Nuclear magnetic resonance, Paramagnetic resonance, Nuclear spins, Electron paramagnetic resonance, Cesium compounds, Copper compounds, Manganese compounds, Chlorides.
Identifiers: Copper chlorides, Manganese chlorides, Cesium chlorides, Copper sulfates.

Progress made under this grant during the period 1 June 1970 to 30 November 1973 toward understanding of magnetic materials is summarized with references to six papers and five Ph.D. theses completed during this period. The progress includes the following: New results on nuclear and electronic spin-waves obtained from measurement of the transient decay of magnetic resonance signals. New information on one dimensional magnetic materials (linear chains) from careful measurement of electron paramagnetic resonance lineshapes, for ((CH3)4 N)MnCl3, Cu(NH3)(SO4).H2O, CsMnCl3.2H2O, and CuCl2.2NC5H5. Progress was made in the application of the cluster model to Hubbard Hamiltonian. Methods were developed for the use of an on-line and interactive computer system to carry out precise measurements of magnetic resonance lineshapes. (Author)

AD-776 413/7GA PC$6.25/MF$1.45
Boeing Co Seattle Wash

THE STRUCTURE OF NON-CRYSTALLINE MATERIALS.
Final rept. 4 Feb 71-31 Dec 73,
Farrel W. Lytle. 31 Dec 73, 61p AROD-9209.8-P
Contract DAHC04-71-C-0010, ARPA Order-1562

Descriptors: *Amorphous materials, *Semiconductors, *X-ray absorption analysis, Hyperfine structure, Fourier analysis, Data processing.
Identifiers: *Amorphous semiconductors.

The primary purpose of this research was to develop the phenomenon of extended x-ray absorption fine structure (EXAFS) as a technique for investigating the structure of non-crystalline materials, particularly amorphous semiconductors.

AD-776 420/2GA PC$6.75/MF$1.45
Northrop Research and Technology Center Hawthorne Calif
RADIATION EFFECTS ON SEMICONDUCTOR MATERIALS AND DEVICES.
Final rept. May-Nov 73,
J. R. Srour, O. L. Curtis, Jr., S. Othmer, K. Y. Chiu, and V. D. Deokar. Dec 73, 276p Rept no. NRTC-73-46R HDL-TR-171-4
Contract DAAG39-73-C-0171
Sponsored in part by Defense Nuclear Agency, Washington, D.C.

Descriptors: *Semiconductors, *Semiconductor devices, *Radiation effects, Silicon, Silicon dioxide, Aluminum compounds, Oxides, Solar cells, Neutron reactions, Gamma rays, Charge transfer, Recombination reactions, Ionizing radiation, Metal oxide semiconductors, Translators.
Identifiers: Aluminum oxides.

Contents:
Analytical studies;
Recombination in irradiated silicon;
Charge transport in silicon dioxide;
Ionizing radiation effects on MOS devices;
Measurement of drift mobility in low-lifetime silicon.

AD-776 422/8GA Reprint
Catholic Univ of America Washington D C Dept of Physics
TRANSITION TEMPERATURES OF SYSTEMS WITH MIXED FERRO AND ANTIFERROMAGNETIC COUPLING,
Paul H. E. Meijer, and J. C. Edwards. 15 Dec 71, 13p AFOSR-TR-74-0314
Grant AF-AFOSR-445-66
Availability: Pub. in Physica, v61 p67-79 72.

Descriptors: *Antiferromagnetism, *Ferromagnetism, *Transition temperature, Mathematical models.
Identifiers: Magnetic ordering.

To study the influence of a mixture of ferromagnetic and antiferromagnetic couplings on the transition temperature of a spin-1/2 system the author used the Bethe or constant-coupling method and applied it to two models:namely, Model A, a system containing two types of atoms with different inter- and intra-spin coupling; Model B, a system which contains two antiferromagnetic sublattices that are ferromagnetically coupled. It is found that for reasonable values of the parameters the Curie temperature has the tendency to increase when the antiferromagnetic coupling is present, at least for the models considered using Ising and anisotropic Heisenberg coupling. The author also was able to develop an expression, based on Model B, for the critical temperature of a spin-1 system. (Modified author abstract)

AD-776 427/7GA Reprint
Wayne State Univ Detroit Mich Dept of Physics

LOW-FIELD ELECTROMAGNETIC GENERALIZATION OF ULTRASONIC SHEAR WAVES IN GALLIUM,
N. K. Batra, R. L. Thomas, K. C. Lee, and A. M. DeGraaf. 16 Jul 73, 6p AFOSR-TR-74-0274
Grant AF-AFOSR-1965-71
Sponsored in part by National Science Foundation.
Availability: Pub. in Physical Review B, v8 n12 p5473-5476, 15 Dec 73.

Descriptors: *Gallium, *Ultrasonic radiation, Single crystals, Magnetic fields, Anisotropy, Cryogenics.

The low-magnetic-field behavior of electromagnetic generation of ultrasonic shear waves is studied in gallium at liquid-helium temperatures. The generation efficiency for shear waves whose polarization is parallel to the impinging rf electric field peaks at exactly zero magnetic field and decreases sharply as a small longitudinal magnetic field is applied. The zero-field generation is largest at low temperatures and falls off rapidly as the temperature is increased. This behavior is in good agreement with a recent theoretical model by Lee et al., which is used to extract the power-law behavior of the carrier relaxation times for different crystallographic orientations of the rf electric field. (Author)

AD-776 432/7GA Reprint
Washington Univ St Louis Mo Dept of Physics
SPIN-PHONON INTERACTIONS IN MAGNETIC MATERIALS.
Final rept. 1 Apr 71-31 Dec 73,
James G. Miller, and Peter A. Fedders. Jan 74, 10p AFOSR-TR-74-0305
Grant AF-AFOSR-2004-71
Availability: Pub. in various journals.

Descriptors: *Magnetic materials, *Magnetic resonance, Nuclear spins, Phonons, Interactions, Paramagnetic resonance, Ultrasonic tests, Rubidium compounds, Manganese compounds, Fluorides, Magnesium oxides.
Identifiers: *Spin phonon interactions, Acoustic paramagnetic resonance, Rubidium fluorides, Manganese fluorides.

In this final scientific report the theoretical and experimental research carried out under AFOSR sponsorship is discussed. Included are discussions of acoustic paramagnetic resonance in dense magnetic insulators (RbMnF3), higher order acoustic paramagnetic resonance in dilute magnetic systems (MgO:Fe(2+)), ultrasonic coupling to nuclear spins in an antiferromagnet (RbMnF3), a novel theory of ultrasonic spin echoes, and acoustic magnetic resonance in metals. In addition to the experimental work performed on material systems, two contributions to experimental ultrasonic techniques are also included: an improved transducer correction for velocity measurement and a transmission oscillator ultrasonic spectrometer. (Author)

AD-776 460/8GA Reprint
National Bureau of Standards Washington D C
CHANGE IN NORMAL SPECTRAL EMITTANCE (AT 650 NM) OF NIOBIUM DURING MELTING AND ITS RELATION TO SURFACE ROUGHNESS,
A. Cezairliyan. 1 Jun 73, 6p AFOSR-TR-74-0372
Availability: Pub. in Surface Science, v40 p429-432 1973.

Descriptors: *Niobium, Melting, Solids, Liquids, Surface roughness.
Identifiers: *Spectral emittance.

Investigations on the normal spectral emittance (at 650 nm) of niobium during melting are reported. An attempt is made to relate the difference between the emittances of solid and liquid niobium at the melting point to the roughness of the solid surface. The results indicate that this difference is primarily due to conditions of the solid surface. (Author)

AD-776 469/9GA Reprint
Wayne State Univ Detroit Mich Dept of Physics
MAGNETOELASTIC EFFECTS IN DILUTE MAGNETIC ALLOYS,
T. J. Moran, and R. L. Thomas. 7 May 73, 3p AFOSR-TR-74-0275
Grant AF-AFOSR-1965-71
Availability: Pub. in Physics Letters, v45A n5 p413-414, 22 Oct 73.

Descriptors: *Magnetic alloys, *Magnetostriction, Copper alloys, Manganese alloys, Silver alloys, Iron alloys, Ultrasonic tests, Cryogenics.
Identifiers: *Magnetoelastic effect, Magnetic susceptability, Magnetic ordering.

Ultrasonic studies of CuMn, AuMn and AuFe alloys where the concentrations of the transition metal ranges between 1 and 10% show that the longitudinal sound velocity has a marked field dependence at temperatures below the peak in the magnetic susceptibility and a negligible field dependence above it. This suggests that there may be an ordered magnetic state in these alloys. (Author)

AD-776 474/9GA Reprint
California Univ Davis Dept of Physics
ELECTRONIC CHARGE DENSITIES FOR TWO LAYER SEMICONDUCTORS--TIN SULFIDE AND TIN SELENIDE,
C. Y. Fong, and M. L. Cohen. 1974, 7p AFOSR-TR-74-0270
Grant AF-AFOSR-2353-72
Availability: Pub. in Jnl. of Physics C: Solid State Physics, v7 p107-112 1974.

Descriptors: *Semiconductors, Tin compounds, Sulfides, Selenides, Electric charge, Band theory of solids, Wave functions, Energy band.
Identifiers: *Tin sulfides, *Tin selenides, *Charge density, Pseudopotential theory.

The total valence electronic charge densities for two semiconductors with layer structure - SnS2 and SnSe2 - are calculated using wavefunctions from pseudopotential energy band structure calculations at a representative k point. A comparison is made between the charge density distributions for these two compounds and those of ZnS in the wurtzite structure. (Author)

AD-776 479/8GA Reprint
Cornell Univ Ithaca N Y Materials Science Center
CONDUCTION IN RANDOM SYSTEMS,
V. Ambegaokar, S. Cochran, and J. Kurkijarvi. 9 Apr 73, 8p Rept nos. TR-34, MSC-1980
Contract N00014-67-A-0077-0010, Grant NSF-GH-33637
Availability: Pub. in Physical Review B, v8 n8 p3682-3688, 15 Oct 73.

Descriptors: *Semiconductors, *Amorphous materials, *Electrical conductivity, Mathematical models, Theory.
Identifiers: *Amorphous semiconductors, Percolation theory.

The authors have calculated numerically the conductivity of a system of random points connected by conductances that decrease exponentially with the separation distance. They compare critically various methods that have been proposed to solve the problem of hopping conduction in amorphous semiconductors and observe that the numerical results can be quantitatively understood using ideas based on percolation theory. (Author)

AD-776 486/3GA Reprint
Connecticut Univ Storrs Dept of Physics
THE THERMOELECTRIC POWER OF A METAL IN THE LIMIT OF HIGH PURITY AND LOW TEMPERATURE,
P. G. Klemens. 13 Apr 73, 8p AROD-9190.7-P
Grant DA-ARO-D-31-124-71-G139
Availability: Pub. in Physica, v69 p171-176 1973.

Descriptors: *Metals, *Thermoelectricity, Low temperature, Electrical conductivity, Thermal conductivity.

The electronic component of the thermoelectric power of metals is discussed in the case when a unique relaxation time cannot be defined. It is argued that the relaxation time to be used in the standard expression should be the relaxation time appropriate to isothermal electrical conduction. An old argument due to Bethe is modified to show that the logarithmic derivative of the relaxation time vanishes to first order in the limit when the temperature is low but the electrical resistivity arises from electron-phonon interactions. The thermoelectric power in that case varies as the first power of temperature. (Author)

AD-776 487/1GA Reprint
Wayne State Univ Detroit Mich Dept of Chemistry
MATRIX ENDOR LINEWIDTHS OF TRAPPED SILVER ATOMS AND AROMATIC NITROXIDE RADICALS IN POLYCRYSTALLINE AND GLASSY MATRICES AT 77 K: CORRELATION WITH MATRIX POLARITY,
Barney L. Bales, Robert N. Schwartz, and Larry Kevan. 31 May 73, 4p AROD-9999.5-C
Grant DA-ARO-D-31-124-71-G180
Prepared in cooperation with California State Univ., Northridge. Dept. of Physics and Illinois Univ., Chicago. Dept. of Chemistry.
Availability: Pub. in Chemical Physics Papers, v11 n1 p13-15, 15 Sep 73.

Descriptors: *Free radicals, *Silver, Polarity, Aromatic compounds, Chemical radicals, Glass, Polycrystalline.
Identifiers: Electron nuclear double resonance, Matrix isolation techniques, *Nitroxides.

Matrix ENDOR linewidths are shown to serve as effective probes of weak interactions between radicals and their molecular environment in solid disordered matrices. The linewidths of aromatic nitroxides and silver atoms are analyzed in terms of an effective radius of the unpaired electron distribution which increases monotonically with increasing matrix polarity. (Author)

AD-776 523/3GA Reprint
Naval Research Lab Washington D C
COMMENTS ON THE SUPPRESSION OF VOID NUCLEATION BY OVERSIZE SOLUTE ATOMS,
F. A. Smidt, Jr., and J. A. Sprague. 22 Aug 73, 5p
Availability: Pub. in Scripta Metallurgica, v7 n10 p1065-1068 1973.

Descriptors: *Defects(Materials), *Dislocations, Metals, Alloys, Radiation effects.

An alternative mechanism to vacancy trapping was proposed in another paper, by which oversize solute atoms might suppress void nucleation. The authors agree that the interaction of solute atoms with dislocations is one of several ways in which solutes might influence void formation. However, the authors do not feel this excludes the possibility of vacancy trapping. They present several general comments about implications and assumptions of the Kuhlmann-Wilsdorf model and one specific comment about the model itself.

AD-776 560/5GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
APPROXIMATE CALCULATION OF CRITICAL STRESSES,
L. I. Verein. 3 Dec 73, 7p Rept no. FSTC-HT-23-2068-72
Trans. of Mashinostroenie (USSR) n3 p18-21 1971.

Descriptors: *Stresses, Numerical analysis, Compressive properties, Elastic properties, Translations, USSR.

AD-776 572/0GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
FERROELECTRIC MATERIAL POLARIZATION,
G. A. Zhitomirskii, and E. G. Fesenk-. 7 Nov 73, 3p Rept no. FSTC-HT-23-1217-72
Trans. of Patent (USSR) 268 232, 20 Jul 70.

Descriptors: *Ferroelectric materials, *Polarization, Translations, USSR, Patents.

The proposed invention is relevant to the area of radio electronics in particular to the technology of polarizing seignettoelectric (Rochelle salt) materials. There are known methods of polarizing seignettoelectric materials based on their heat processing and on producing in them a constant electric field. The purpose of the present invention is to raise stability of the seignettoelectric material parameters and to increase its piezoactivity with the raised conductivity below the Curie point, being not less than 10 to the 10th power/ohm-cm.

AD-776 601/7GA Reprint
Stanford Univ Calif W W Hansen Labs of Physics
EFFECTS OF INITIALLY EXCITED HOLE STATES ON THE SOFT-X-RAY EMISSION SPECTRA OF METALS,
John T. Yue, and S. Doniach. 8 Feb 73, 9p AROD-8742.10.P
Grant DA-ARO-D-31-124-73-G11
Availability: Pub. in Physical Review B, v8 n10 p4578-4584 15 Nov 73.

Descriptors: *Lithium, *X ray spectra, *Emission spectra, Metals, Band theory of solids, Line spectra, Excitation.

A general theory of the effects of Coulomb excitation of a deep hole state in a solid on the subsequent soft-x-ray emission line shape is given. For excitation energies well above threshold it is shown that the emission corresponds to the decay of a nonrelaxed initial hole state which is suddenly introduced into the solid. Using a weak-coupling approximation, a generalization of the Weisskopf-Wigner formula for radiative line shapes is derived which includes the enhancement of the high-energy tail of an emission line or edge due to initial excitations. Comparison of the approximate results with measurements of the K edge of Li metal provides a reasonable explanation of the observed discrepancy between absorption and emission line shapes. (Author)

AD-776 606/6GA Reprint
Louisiana State Univ Baton Rouge Dept of Physics and Astronomy
LATTICE RELAXATIONS NEAR A VACANCY OR INTERSTITIAL IN ALUMINUM,
S. P. Singhal. 14 Mar 73, 11p AROD-10588.1-C
Grant DA-ARO-D-31-124-73-G133
Availability: Pub. in Physical Review B, v8 n8 p3641-3649, 15 Oct 73.

Descriptors: *Aluminum, *Defects(Materials), *Phonons, Interstitials, Crystal defects, Elastic properties, Matrix algebra, Least squares method.

The method of lattice statics is applied to calculate the lattice relaxations in the vicinity of a vacancy or an interstitial defect in aluminum. A least-squares fit to the phonon spectrum obtained by Stedmann and Nilsson was used, in conjunction with the elastic constants as contraints, to derive the dynamical matrix including up to eighth-neighbor interactions. The interionic interaction was obtained by using Harrison's model pseudopotential, with parameters adjusted to give a best fit with the phonon data. For a vacancy, the relaxations are found to be 2% (of the lattice constant) or smaller. For the nominal interstitial, the first neighbors are found to relax by 17% and the rest of the neighbors by 3% or less. (Author)

AD-776 712/2GA Reprint
Oregon Univ Eugene
QUASI-ATOMIC L-MM AUGER SPECTRA OF SOLID CU AND ZN,
L. Yin, I. Adler, T. Tsang, M. H. Chen, and B. Craseman. 13 Aug 73, 3p AROD-10121.14-P
Grant DAHC04-74-G-0065
Sponsored in part by National Aeronautics and Space Administration, Washington, D.C.
Availability: Pub. in Physics Letters, v46A n2 p113-114, 3 Dec 73.

Descriptors: *Copper, *Zinc, *Band theory of solids, Auger electrons, Spectroscopy.

Experimental L(3)-M(4,5)M(4,5) Auger spectra of metallic Cu and Zn show distinct characteristics of free-atom spectra but do not reflect the band structure. This quasi-atomic phenomenon in solids is tentatively explained as electron localization due to increased screening. (Author)

AD-776 721/3GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Electrical Engineering
BARRIER DETERMINATIONS ON GE-AL(X)GA(1-X)ASAL(X)GA(1-X)AS P-N HETEROJUNCTIONS,
D. S. Howarth, and D. L. Feucht. 19 Jul 73, 3p AROD-3397.27-E
Grant DA-ARO-D-31-124-72-G33
Revision of report dated 1 Jun 73.
Availability: Pub. in Applied Physics Letters, v23 n7 p365-367 1 Oct 73.

Descriptors: *Semiconductor junctions, *Gallium arsenides, *Band theory of solids, Aluminum compounds, Arsenides, Electrical properties.
Identifiers: *Heterojunctions, *Aluminum arsenides.

The energy barriers for p-n GeAl(x)Ga(1-x)As and GaAs-Al(x)Ga(1-x)As heterojunctions have been determined by capacitance measurements. The results indicate that the valence band of Al(x)Ga(1-x)As tends to remain fixed with respect to the vacuum level for different values of x. This leads to spiked barriers in the conduction band for these junctions. The values determined for the barriers are consistent with measurements on p-p Ge-GaAs junctions. (Author)

AD-776 758/5GA PC$3.00/MF$1.45
Utah Univ Salt Lake City Dept of Physics
RE-INTERPRETATION OF THE TI(3+) INTERSTITIAL ESR SPECTRUM IN RUTILE,
L. N. Shen, O. W. Johnson, W. D. Ohlsen, and John W. DeFord. 14 Mar 74, 11p
Grant DAHC15-73-C-G2

Descriptors: *Electron paramagnetic resonance, *Rutile, Interstitials, Hydrogen, Titanium.
Identifiers: Lattice parameters, Interstitials.

A variety of rutile samples were heat treated in atmospheres of H2, H2O, and O2 according to prescriptions which theoretically and experimentally either favor or suppress H interstitial formation. The H concentration and conduction electron concentrations in the samples were monitored optically. The 'A' spectrum, which has been universally accepted as being due to Ti(3+) interstitials, is found instead to be associated with H. (Author)

AD-776 886/2GA PC$5.75/MF$1.45
Michigan Univ Ann Arbor Electron Physics Lab
DETERMINATON OF CURRENT VS. ELECTRIC FIELD CHARACTERISTICS IN MULTIVALLEY SEMICONDUCTORS.
Interim technical rept. 1 Aug-1 Nov 73,
E. H. Sigman. 1 Nov 73, 215p Rept no. TR-129
RADC-TR-73-401
Contract F30602-71-C-0099

Descriptors: *Semiconductors, Mathematical models, Microwave equipment, Electric fields, Electric current, Direct current, Electron density, Electron energy, Phonons, Boltzmann equation, Maxwells equations, Germanium, Gallium phosphides, Computer programs, FORTRAN.

A computer simulation of the dc transport characteristics for both isotropic and anisotropic semiconductors of any arbitrary band structure is developed. A distinct drifted Maxwell-Boltzmann distribution is used for each band. The zeroth, first and second moments of the Boltzmann equation are used to calculate the electron density, velocity and temperature in each of the conduction bands for an applied electric field of any arbitrary orientation. Acoustic phonon, optical phonon and polar optical phonon scattering are included in the analysis. A computer subroutine which calculates the collision integral due to phonon scattering by using numerical integration is developed and a solution scheme for the current vs. electric field characteristics which uses this subroutine is presented. The computer program is used to determine the current vs. electric field characteristics for n-Ge for given electric field orientations. (Modified author abstract)

AD-776 836/9GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
STATISTICAL METHODS IN THE THEORY OF SPINODAL DECOMPOSITION,
James S. Langer. 7 Jun 73, 13p AFOSR-TR-74-0450
Grant AF-AFOSR-2311-72
Summary in French and German.
Availability: Pub. in Acta Metallurgica, v21 p1649-1659 Dec 73.

Descriptors: *Alloys, *Phase transformations, Statistical analysis, X rays, Aluminum alloys, Zinc alloys, Temperature, Nonlinear systems.
Identifiers: Spinoidal decomposition, X ray scattering, Aluminum alloy 22Zn.

The report summarizes, without detailed derivations, some recent developments in the theory of spinodal decomposition. The new theory takes into account both thermal fluctuations and nonlinear effects in computing the X-ray scattering from solid solutions undergoing phase separation. The theory is worked out in detail using parameters appropriate for an Al-Zn alloy containing 22% Zn and aged at 150C. Although the theory is in excellent quantitative agreement with experiment, there arise some interesting questions of interpretation. (Author)

AD-776 837/7GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
THEORY OF EARLY-STAGE SPINODAL DECOMPOSITION,
James S. Langer, and Moshe Bar-on. 19 Jun 72, 34p AFOSR-TR-74-0449
Grant AF-AFOSR-2311-72
Availability: Pub. in Annals of Physics, v78 n2 p421-452 Jun 73.

Descriptors: *Glass, *Alloys, *Phase transformations, Numerical analysis, X rays, Nonlinear systems.
Identifiers: *Spinodal decomposition, X ray scattering.

In the article the authors discuss a new mathematical description of the growth of correlations and the first appearance of well-defined single-phase regions during spinodal decomposition in unstable solid solutions. The theory is based on the physical ideas of Cahn and coworkers, but includes both thermal fluctuations and nonlinear effects. Preliminary numerical results are in excellent qualitative agreement with X-ray scattering experiments on alloys and glasses. (Modified author abstract)

AD-776 838/5GA Reprint
University of Southern California Los Angeles Dept of Electrical Engineering
MAGNETOSTRICTION OF SI-DOPED YIG AT LOW TEMPERATURES,
D. R. Mack, and J. Smit. 6 May 73, 5p AFOSR-TR-74-0407

Contract F44620-71-C-0067
Availability: Pub. in Jnl. Applied Physics, v2 p23-25 1973.

Descriptors: *Yttrium iron garnet, *Magnetostriction, Doping, Silicon, Cryogenics.

The magnetostriction of Fe(2+) ions introduced by Si(4+) in YIG, has been measured at low temperatures by means of strain gauges. It is substantially larger at 77K, than at 4K. This is explained by electron migration at elevated temperatures, leading to a decrease in perturbing potential of the Si ions by a factor two. (Author)

AD-776 842/7GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
LOCALIZED VIBRATIONAL MODES OF LI DEFECT COMPLEXES IN GAAS,
M. E. Levy, and W. G. Spitzer. 4 May 73, 24p
AFOSR-TR-74-0388
Contract F44620-71-C-0067
Availability: Pub. in Jnl. of Physics C. Solid State Physics, v6 p3223-3244 1973.

Descriptors: *Semiconductors, *Gallium arsenides, *Impurities, Lithium, Diffusion, Defects(Materials), Band theory of solids.

Li defects created in GaAs by high-temperature Li diffusion were studied via their IR-active localized vibrational modes. Detailed measurement and analysis of spectra due to Li isotope mixtures yielded the numbers of Li atoms/complex and Li site equivalences; the results of the entire experimental programme characterized five types of Li defects as follows: (1) a donor complex with three Li atoms in equivalent sites; (2) an acceptor complex with two Li atoms in equivalent sites; (3) a neutral complex with two Li atoms in inequivalent sites; (4) a neutral complex with two or three Li atoms in inequivalent sites; and (5) an unsymmetrical, neutral complex with at least three Li atoms in inequivalent sites. These results contradict the conclusions of previous studies of Li in GaAs. (Modified author abstract)

AD-776 949/0GA PC$3.00/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va
SUPERCONDUCTING THIN FILMS IN THE NIOBIUM-VANADIUM AND TITANIUM-TANTALUM SYSTEMS.
Rept. for Jul 72-Jul 73,
Hermann J. Spitzer. Feb 74, 12p Rept no. USAMERDC-2088

Descriptors: *Superconductors, Thin films, Niobium alloys, Vanadium alloys, Tantalum alloys, Titanium alloys, Transition temperature.

Thin films of Nb-V and Ti-Ta allloys have been deposited by DC co-sputtering onto fused quartz at substrate temperatures of 700C. Deposition rates averaged 100A per minute and the thickness of all samples was of the order of 3000A. Jc-H characteristics were measured by a pulsed field-pulsed current technique and Tc's by monitoring the electrical resistance with temperature. Tc's in the Ti-Ta system are generally lower than in bulk, but considerably higher in the Nb-V system. The Jc's in both systems are comparatively high at low fields, but fall off rapidly with increasing magnetic fields. (Author)

AD-776 977/1GA PC$3.25/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Engineering Science and Mechanics
EXPERIMENTAL DETERMINATION OF SIDE BOUNDARY EFFECTS ON STRESS INTENSITY FACTORS IN SURFACE FLAWS.
9Rept. for 1973-1974,
M.. Jolles, J. J. McGowan, and C. W. Smith. Mar 74, 27p Rept no. VPI-E-74-5
Contract DAAF07-69-C-0444

Descriptors: *Photoelasticity, *Surfaces, Numerical analysis, Defects(Materials), Stresses, Taylors series, Crack propagation, Fracture(Mechanics).
Identifiers: Stress intensity factor, Stress freezing.

A technique consisting of stress-freezing photoelasticity coupled with a Taylor Series Expansion of the maximum local in-plane shearing stress known as the Taylor Series Correction Method (TSCM) is applied to the determination of stress intensity factors (SIF's) in flat bottomed surface flaws of flaw depth/length ratios of approximately 0.033. Flaw depth/thickness ratios of approximately 0.20 and 0.40 were studied as were plate width/crack length ratios of approximately 2.33 and 1.25, the former of which corresponded to a nearly infinite width. Agreement to well within 10% was found with the Rice-Levy and Newman theories using a depth-modified secant correction and equivalent flaw depth/length ratios. The Shah-Kobayashi Theory, when compared on the same basis, was lower than the experimental results. On the basis of the experiments alone, it was found that the SIF was intensified by about 10% by decreasing the plate width/crack length from 2.33 to 1.25. (Author)

AD-776 994/6GA PC$3.75/MF$1.45
Stanford Univ Calif Microwave Lab
STUDY OF NONLINEAR ACOUSTICS FOR THE PURPOSE OF PROCESSING SOPHISTICATED SIGNALS.
Final rept. 30 Nov 70-29 Nov 73,
C. F. Quate. Feb 74, 56p Rept no. ML-2263
AROD-9358.7-E
Contract DAHC04-71-C-0005

Descriptors: *Acoustic waves, *Signal processing, Piezoelectric materials, Semiconductors, Surface waves, Space charge, Nonlinear systems, Silicon, Piezoelectric effect.
Identifiers: *Nonlinear acoustics, *Acoustic surface waves, *Piezoelectric semiconductors, Image processing Acoustoelectric effect.

The nonlinear interaction between two surface acoustic waves can be used in a number of signal processing devices. In this report the principles which underlie this interaction are developed both theoretically and experimentally. In the signal processing devices it is demonstrated that both convolution and fourier transformations can be carried out in real time. In the imaging work it is shown that acoustic surface waves can be used to scan optical images which are projected onto a semiconducting layer of silicon. This scanning process transfers spatial image pattern into a temporal pattern which can be transmitted electrically to a remote display station. (Modified author abstract)

AD-777 017/5GA PC$3.75/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Mechanics Div
SECOND HARMONIC GENERATION AND PARAMETRIC EXCITATION OF SURFACE WAVES IN ELASTIC AND PIEZOELECTRIC SOLIDS.
Technical rept.,
H. F. Tiersten, and J. C. Baumhauer. Mar 74, 61p Rept no. TR-9
Contract N00014-67-A-0117-0007

Descriptors: *Piezoelectric materials, *Surface waves, Elastic waves, Excitation, Nonlinear differential equations, Boundary value problems, Harmonic analysis.
Identifiers: *Second harmonic generation, Electroelasticity.

Nonlinear electroelastic equations, quadratic in the small field variables, are applied in the analysis of second harmonic generation of surface waves in piezoelectric solids. Preliminary to the treatment of the anisotropic piezoelectric case, the more tractable problems of the second harmonic generation and parametric excitation of surface waves in isotropic elastic solids are treated. In all instances the solutions asymptotically satisfy the nonlinear differential equations and boundary conditions on the surface of the semi-infinite solid to a specified order in a small parameter. Since the equations are quadratic, rather than cubic, in the small field variables, only the initial spatial rates of growth of the harmonically generated and parametrically excited waves are determined. Nevertheless, an extension of the analysis to enable the calculation of more than the aforementioned initial slopes is indicated. In the isotropic elastic case the solution for the second harmonic reveals, among other things, that the ratio of the dilatational to equivoluminal portions of the growing second harmonic is the same as in the input Rayleigh wave. (Author)

BNL-18316 PC$3.00/MF$1.45
Bell Telephone Labs., Inc., Murray Hill, N.J. (Usa); Brookhaven National Lab., Upton, N.Y. (Usa).
MAGNETIC ORDERING AND HYPERFINE PARAMETERS IN THE LINEAR CHAIN COMPOUND RBFEBR SUB 3 .
M. Eibschuetz, G. R. Davidson, and D. E. Cox. 1972, 5p CONF-731104-12

Descriptors: (*Rubidium bromides, *Magnetic moments), (*Iron bromides, Magnetic moments), Absorption spectra, Crystal structure, Iron 57, Isomer shift, Moessbauer effect, Neutron diffraction, Order parameters, Ultralow temperature.

For abstract, see NSA 29 07, number 17997.

CALT-822-54 PC$3.00/MF$1.45
California Inst. Of Tech., Pasadena (Usa). W.M. Keck Lab. Of Engineering Materials.
SUPERCONDUCTING COMPOSITE OF COPPER AND NIOBIUM: A METALLURGICAL APPROACH.
C. C. Tsuei. Oct 73, 18p
Contract AT(04-3)-822

Descriptors: (*Copper base alloys, *Superconductivity), (*Niobium alloys, Superconductivity), (*Aluminium alloys, Superconductivity), Chemical composition, Composite materials, Critical current, Microstructure, Quantity ratio, Transition temperature.

For abstract, see NSA 29 07, number 17064.

CALT-822-58 PC$4.00/MF$1.45
California Inst. Of Tech., Pasadena (Usa). W.M. Keck Lab. Of Engineering Materials.
EFFECT OF MANGANESE AND PHOSPHORUS CONCENTRATION ON THE ATOMIC DISTRIBUTION FUNCTION OF AMORPHOUS PD--MN--P ALLOYS.
N. I. Marzwell. Jan 74, 40p
Contract AT(04-3)-822

Descriptors: (*Palladium base alloys, *Crystal structure), (*Manganese alloys, Crystal structure), (*Phosphorus additions, Crystal structure), Amorphous state, Order-disorder transformations.

For abstract, see NSA 29 07, number 17998.

CEA-CONF-2144 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
STUDY OF DEFECTS PRODUCED BY ION IMPLANTATION OF SILICON(III) USING TRANSMISSION ELECTRON MICROSCOPY.
R. Truche, M. Dupuy, and D. Lafeuille. 8 Jun 73, 18p CONF-730574-9
In French. U.S. Sales Only.

Descriptors: (*Silicon, *Ion implantation), Amorphous state, Annealing, Arsenic ions, Crystal defects, Electron microscopy, Layers, Phosphorus ions, Physical radiation effects, Recrystallization, Twinning.

For abstract, see NSA 29 07, number 16363.

COM-74-50186/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTERMAG KEYNOTE ADDRESS: 1973: NBS-THE MAGNETIC DOMAIN.
Final rept.,
Richard W. Roberts. 1973, 4p
Pub. in IEEE Transactions on Magnetics, vMAG-9 n3 p152-155 Sep 73.

Descriptors: *Magnetic materials, *Research, Equipment.

The National Bureau of Standards has been active in magnetic research for 70 years, in such areas as theory, development of magnetic devices, and use of magnetism in other scientific investigations. Highlights of NBS programs, past and present, are featured.

COM-74-50200/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TWO-ELECTRON U CENTERS IN IONIC CRYSTALS: POINT-ION MODELS.
Final rept.,
Herbert S. Bennett. 1972, 5p
Pub. in Physical Review, B, Solid State, v6 n10 p3936-3940, 15 Nov 72.

Descriptors: *Color centers, Ionic crystals, Sodium chloride, Potassium chloride, Calcium fluorides, Barium halides, Cadmium halides, Strontium halides, Atomic energy levels.
Identifiers: Barium fluorides, Cadmium fluorides, Strontium fluorides.

The Hartree-Fock-Slater (HFS) equations for the two-electron orbitals about a proton located substitutionally at an anion site have been solved numerically in the point-ion lattice potential. The lattice relaxation of the nearest-neighbor ions is included in the model. The five lowest-lying U-center states for NaCl, KCl, CdF2, CaF2, SrF2, and BaF2 have been calculated within the framework of the above model.

COM-74-50208/9GA Not available NTIS
National Bureau of Standard, Washington, D.C.
SOFT X-RAY STUDY OF THE D-BANDS IN AUAL2.
Final rept.,
A. J. McAlister, J. R. Cuthill, R. C. Dobbyn, and M. L. Williams. 1973, 13p
Pub. in Proceedings of International Conference on Band Structure, Spectroscopy of Metals and Alloys, Strathclyde, 26-30 Sep 71, Glasgow, Scotland p191-203.

Descriptors: *Gold intermetallics, *Band structure of solids, Intermetallics, Emission spectra, Aluminum alloys.
Identifiers: *Aluminum intermetallics.

The N(6,7) soft x-ray emission spectrum (5d to 4f transition) of Au in AuAl2 has been measured. This work, together with the x-ray photo-emission results of Chan and Shirley, shows the d-bands to be distributed over a range of approximately 4 eV, with maxima at 5.0 and 7.1 eV below the Fermi level. These results raise some questions about the interpretation of the Al L emission spectrum from the compound, which appeared to offer strong confirmation of non-relativistic band calculations of the electronic structure of AuAl2, and again raise the possibility of d-band participation in the strong coloring of the compound, an effect which the Al emission spectrum and non-relativistic band calculations appeared to exclude.

COM-74-50235/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
USING THE SEMICONDUCTOR JUNCTION IN QUANTUM INTERFERENCE DEVICES.
Final rept. Sep 72-Jan 73,
M. B. Simmonds. 1974, 3p
Pub. in Jnl. of Applied Physics, v45 n1 p366-368 Jan 74.

Descriptors: *Semiconductor devices, *Superconductors, Josephson junctions, Semiconductor junctions, Lead, Tellurium.
Identifiers: SQUID(Superconducting QUantum Interference Devices), Superconducting quantum interference devices.

The author has fabricated small area tunnel junctions of a lead-tellurium-lead structure. These have been used in conjunction with bulk superconductors to make hybrid quantum interference devices. These devices were operated at bias frequencies of 30 MHz, 300 MHz, and 10 GHz.

COM-74-50306/1GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Heat Div.
CRYOGENIC PHYSICS SECTION, SUMMARY OF ACTIVITIES - 1973.
Annual rept., 1 Jan-31 Dec 74,
R. J. Soulen, Jr. Mar 74, 24p NBS-TN-823
Paper copy available from GPO $0.60.

Descriptors: *Temperature measurement, *Cryogenics, Josephson junctions, Superconductivity, Paramagnetism, Thermal noise, Nuclear magnetic resonance.
Identifiers: Noise thermometry.

The report summarizes the research activities of the Cryogenic Physics Section which specifically relate to thermometry. The topics range from superconductive fixed points to nuclear orientation thermometry, as well as Josephson junction noise thermometry and paramagnetism. (Author)

CONF-731028-5 PC$3.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Atomic Power Div.
REVIEW OF ION SIMULATION OF HIGH-TEMPERATURE NEUTRON DAMAGE AND VOID FORMATION.
G. L. Kulcinski. 1973, 26p

Descriptors: (*Metals, Physical radiation effects), (*Physical radiation effects, *Simulation), Ion beams, Neutron beams, Reviews, Swelling, Voids.

For abstract, see NSA 29 07, number 16343.

CONF-731104-11 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
MOESSBAUER STUDY OF ORIENTED YBCRO SUB 3 POWDER.
G. R. Davidson, B. D. Dunlap, and L. G. Eibschuetz van Uitert. 1973, 6p

Descriptors: (*Ytterbium compounds, *Magnetic susceptibility), (*Chromates, Magnetic susceptibility), Absorption spectra, Ferromagnetic materials, Moessbauer effect, Orientation, Orthorhombic lattices, Powders, Ultralow temperature, Ytterbium ions, Ytterbium 170.

For abstract, see NSA 29 07, number 18000.

COO-1198-1025 PC$3.00/MF$1.45
Illinois Univ., Urbana (Usa).
POINT DEFECTS IN SEMICONDUCTORS.
J. S. Koehler. 1973, 10p CONF-731054-1
Contract AT(11-1)-1198

Descriptors: (*Semiconductor materials, *Point defects), Physical radiation effects, Reviews.

For abstract, see NSA 29 07, number 16364.

COO-1198-1029 PC$8.25/MF$1.45
Illinois Univ., Urbana (Usa).
INTERNAL FRICTION IN INTRINSIC AND N-TYPE GERMANIUM AND SILICON.
A. P. Gerk. Feb 74, 122p
Contract AT(11-1)-1198

Descriptors: (*Germanium, *Internal friction), (*Silicon, Internal friction), Charge carriers, Damping, Deformation, Dislocations, Doped materials, N-type conductors.

For abstract, see NSA 29 07, number 18001.

COO-1198-1031 PC$7.25/MF$1.45
Illinois Univ., Urbana (Usa).
HYPERFINE INTERACTIONS IN FERRITES AND ORTHOFERRITES AT HIGH PRESSURE.
N. A. Halasa. Feb 74, 102p
Contract AT(11-1)-1198

Descriptors: (*Iron oxides, *Magnetic fields), (*Nickel oxides, Magnetic fields), Hyperfine structure, Interactions, Moessbauer effect, Pressure dependence, Spectroscopy, Very high pressure.

For abstract, see NSA 29 07, number 18002.

COO-1591-24 PC$3.00/MF$1.45
Utah Univ., Salt Lake City (Usa). Div. Of Materials Science and Engineering.
IMPURITY EFFECTS ON THE CREEP OF POLYCRYSTALLINE MAGNESIUM AND ALUMINUM OXIDES AT ELEVATED TEMPERATURES. TECHNICAL PROGRESS REPORT, DECEMBER 19, 1972--DECEMBER 18, 1973.
R. S. Gordon. 1973, 28p
Contract AT(11-1)-1591

Descriptors: (*Magnesium oxides, *Creep), (*Aluminium oxides, Creep), Diffusion, Doped materials, Grain boundaries, Grain size, Impurities, Iron additions, Mass transfer, Polycrystals, Stresses.

For abstract, see NSA 29 07, number 18003.

COO-1676-29 PC$3.00/MF$1.45
Republic Steel Corp., Cleveland, Ohio (Usa); Case Western Reserve Univ., Cleveland, Ohio (Usa).
INTERNAL FRICTION OF FERROUS MARTENSITES.
G. J. Klems, R. E. Miner, F. A. Hultgren, and R. Gibala. 31 Oct 73, 11p CONF-730844-2
Contract AT(11-1)-1676

Descriptors: (*Iron alloys, *Internal friction), (*Nickel alloys, Internal friction), (*Carbides, Internal friction), (*Carbon steels, Internal friction), Martensite, Medium temperature, Precipitation, Silicon alloys.

For abstract, see NSA 29 07, number 18004.

COO-2166-15 PC$3.00/MF$1.45
Michigan Technological Univ., Houghton (Usa). Dept. Of Metallurgical Engineering.
STUDY OF GRAIN BOUNDARY SEGREGATION USING THE AUGER ELECTRON EMISSION TECHNIQUE. ANNUAL TECHNICAL PROGRESS REPORT, III, JANUARY 1, 1973--DECEMBER 31, 1973.
D. F. Stein, and L. A. Heldt. 1973, 13p
Contract AT(11-1)-2166

Descriptors: (*Grain boundaries, *Segregation), (*Nickel alloys, *Ruptures), Auger effect, Impurities, Microscopy, Research programs, Spectroscopy.

For abstract, see NSA 29 07, number 18005.

COO-3151-19 PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Lab. Of Atomic and Solid State Physics.
LOW-TEMPERATURE SPECIFIC HEAT AND THERMAL CONDUCTIVITY OF NONCRYSTALLINE DIELECTRIC SOLIDS.
R. B. Stephens. Mar 73, 36p

Descriptors: (*Arsenic sulfides, *Thermodynamic properties), (*Boron oxides, Thermodynamic properties), (*Sodium silicates, Thermodynamic properties), (*Calcium nitrates, Thermodynamic properties), Amorphous state, Debye temperature, Germanium oxides, Potassium nitrates, Specific heat, Thermal conductivity, Ultralow temperature, Varnishes.

For abstract, see NSA 29 07, number 18008.

COO-3476-7 PC$3.00/MF$1.45
State Univ. Of New York, Stony Brook (Usa). Coll. Of Engineering.
APPLICATIONS OF MICRODYNAMICS AND LATTICE MECHANICS TO PROBLEMS IN PLASTIC FLOW AND FRACTURE. PROGRESS REPORT, JANUARY 1, 1973--DECEMBER 31, 1973.
J. C. Bilello. 1973, 19p
Contract AT(11-1)-3476

Descriptors: (*Tungsten, Internal friction), (*Internal friction, *Temperature dependence), (*Copper, *Dislocations), (*Copper alloys, Dislocations), Bcc lattices, Binary alloy systems, Damping, Deformation, Degassing, Fcc lattices, Fractures, Impurities, Low temperature, Medium temperature, Monocrystals, Motion, Nickel alloys, Plasticity, Polycrystals, Slip, Ultrahigh vacuum, Ultralow temperature, Ultrasonic testing, Very low temperature.

For abstract, see NSA 29 07, number 16249.

LBL-2269 PC$4.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
ELECTRONIC STRUCTURE OF NARROW GAP SEMICONDUCTORS.
M. L. Cohen. Sep 73, 36p CONF-730975-1
Contract W-7405-eng-48

Descriptors: (*Semiconductor materials, *Electronic structure), Germanium compounds, Lead compounds, Lead sulfides, Selenides, Superconductivity, Tellurides, Tin compounds.

For abstract, see NSA 29 07, number 18009.

N74-17468/1GA PC$3.25/MF$1.45
Brown Univ., Providence, R.I.
EFFECTS OF SIZE, SHAPE, AND FREQUENCY ON THE ANTIFERROMAGNETIC RESONANCE LINEWIDTH OF MNF.
Final Technical Report, Nov. 1966 - Jun. 1973.
K. C. Obrien. Sep 73, 22p NASA-CR-132900
Contract NGL-40-002-042

Descriptors: *Antiferromagnetism, *Fluorides, *Manganese compounds, Equations of motion, Nickel oxides, Resonant frequencies, Submillimeter waves.

For abstract, see STAR 1208

N74-17469/9GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE ROLE OF SURFACE STATES IN THE FORMATION OF A SCHOTTKY BARRIER AT A METAL/GALLIUM ARSENIDE CONTACT.
G. B. Seyranyan, and Y. A. Tkhorik. Jan 74, 11p
NASA-TT-F-15241
Contract NASW-2483
Tran-Transl. Into English from Popuprovodnikovaya Tekhnika I Mikroelektronika, No. 11, 1973 p 34-40. Conf-Presented at the 4TH All-Union Conf. On Electron. Phenomena on Semiconductor Surfaces, Kiev, 1971.

Descriptors: *Gallium arsenides, *Metals, *Surface properties, *Work functions, Crystallography, Electric current, Electron states.

For abstract, see STAR 1208

N74-17471/5GA PC$11.50/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Inst. fuer Festkoerperforschung.
FLUX LINES IN TYPE 2 SUPERCONDUCTORS.
H. Ullmaier. Jun 73, 188p JUL-958-FF
Language in German.

Descriptors: *Eddy currents, *Lines of force, *Superconductors, Carrier mobility, Electromagnetic properties, Magnetic flux.

For abstract, see STAR 1208

ORO-3674-5 PC$9.50/MF$1.45
Georgia Inst. Of Tech., Atlanta (Usa). Engineering Experiment Station.
MAGNETIC PHENOMENA AT METAL SURFACES. FINAL REPORT, 1 JANUARY 1971--31 MARCH 1973.
S. Spooner. 1973, 150p
Contract AT(40-1)-3674

Descriptors: (*Cobalt, *Magnetic properties), (*Cobalt alloys, Magnetic properties), (*Iron carbonates, Magnetic properties), Crystal field, Films, Interactions, Magnons, Neutron beams, Phonons, Scattering.

For abstract, see NSA 29 07, number 18010.

RISO-M-1658 PC$3.25/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
MAGNETISM OF NACL TYPE URANIUM COMPOUNDS.
O. Danielsen. Sep 73, 22p
U.S. Sales Only.

Descriptors: (*Uranium compounds, *Magnetic properties), (*Arsenides, Magnetic properties), (*Chalcogenides, Magnetic properties), (*Phosphides, Magnetic properties), Antimony compounds, Band theory, Bismuth compounds, Electronic structure, Reviews, Uranium sulfides.

For abstract, see NSA 29 07, number 16369.

SLL-73-5265 PC$3.50/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
EFFECTS OF EXP 60 CO GAMMA-RAY IRRADIATION ON OPTICAL PROPERTIES OF NATURAL AND SYNTHETIC QUARTZ FROM 85 TO 300K.
P. L. Mattern, K. Lengweiler, and P. W. Levy. Jun 73, 28p CONF-730671-1
Contract AT(29-1)-789

Descriptors: (*Quartz, *Physical radiation effects), Absorption spectra, Crystal lattices, Electric charges, Gamma radiation, Low temperature, Luminescence, Medium temperature, Optical properties, Photon beams, Point defects, Traps.

For abstract, see NSA 29 07, number 16143.

UCR-34-P-77-38 PC$10.25/MF$1.45
California Univ., Riverside (Usa).
ANNUAL REPORT.
G. E. Everett. 1973, 165p
Contract AT(04-3)-34

Descriptors: (*Europium compounds, *Magnetic properties), (*Chalcogenides, Magnetic properties), (*Chromium chlorides, Magnetic properties), (*Gadolinium nitrides, Magnetic properties), Magnetic susceptibility, Microwave radiation, Resonance, Samarium compounds, Tellurides, Synthesis.

For abstract, see NSA 29 07, number 18017.

20M. Thermodynamics

AD-776 445/9GA Reprint
Cornell Univ Ithaca N Y Center for Applied Mathematics
FULLY DIFFUSED REGIONS,
G. S. S. Ludford, and R. A. Robertson. 29 Sep 72, 13p AROD-5329.44-M
Grants DA-ARO-D-31-124-71-G163, NSF-GP-28483
Availability: Pub. in SIAM, Jnl. of Applied Mathematics, v25 n4 p693-703 Dec 73.

Descriptors: *Heat transfer, *Partial differential equations, Potential theory.

AD-776 529/0GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ELECTRICAL SIMULATION OF NONLINEAR HEAT AND MASS TRANSFER PROBLEMS,
N. A. Fridlender. 21 Feb 74, 10p Rept no. FSTC-HT-23-405-72
Trans. of unidentified Russian language article.

Descriptors: *Heat transfer, *Mass transfer, *Nonlinear differential equations, Partial differential equations, Electrical networks, Mathematical models, Translations, USSR.

Nonlinear heat and mass transfer equations are modeled by means of electric simulation. The difference equations are simulated by the relationships on the networks obtained from Kirchhoff's law. The article discusses an electrical model for the solution of the system of differential equations in 2 unknown functions with a moving intensive evaporation surface. The heat and mass transfer equations are simulated by 2 resistance circuits. Each half of the circuit presents an independent boundary problem. Electrical modeling showed satisfactory agreement between the function which was obtained and the full scale experiment.

AD-776 558/9GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
DETERMINATION OF HEAT FLUX FROM TEMPERATURE MEASUREMENTS AT A SINGLE POINT,
V. I. Zhuk, and A. S. Golosov. 7 Dec 73, 15p Rept no. FSTC-HT-23-1970-72
Trans. of Zhurnal Metallurgiya (USSR) n7 p45-56 1970.

Descriptors: *Heat flux, Numerical analysis, Translations, USSR.

The paper presents a novel method for determining heat fluxes, knowledge of which is often useful in electrical power engineering, as well as in mechanical engineering. The present method, which is based on solution of the inverse heat conductivity problem for an unbounded plane of finite thickness, enables one to determine heat flux from temperature measurements at a single point on or near the heated surface.

AD-776 602/5GA Reprint
Stanford Univ Calif Dept of Applied Physics
THEORY OF THE CRITICAL TEMPERATURE OF SUPERFLUID PHASE TRANSITIONS IN TWO DIMENSIONS,
S. Doniach. 18 Sep 73, 5p AROD-8742.12-P
Grant DA-ARO-D-31-124-73-G11
Revision of report dated 4 Jun 73.
Availability: Pub. in Physical Review Letters, v31 n24 p1450-1453, 10 Dec 73.

Descriptors: *Superfluidity, *Liquid helium, Phase transformations, Field theory, Thin films.
Identifiers: Critical temperature.

An argument is given that a model field theory with an n-component order parameter has a nonzero critical temperature for large n in two dimensions. A simple dependence of the depression of the lambda point below (T sub lambda)(bulk) on film thickness is found which correlates with properties of the heat capacity for multilayer He films on graphite observed by Bretz. (Author)

AD-776 864/1GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
DYNAMICS OF CHARGED VORTEX RINGS IN SUPERFLUID HELIUM,
M. Y. Yu. 18 Jan 73, 5p AFOSR-TR-74-0405
Grant AF-AFOSR-2224-72
Prepared in cooperation with Umea Univ. (Sweden). Dept. of Plasma Physics.
Availability: Pub. in Physica Scripta, v8 p67-69 1973.

Descriptors: *Superfluidity, *Liquid helium, *Vortices, Interactions, Kinetic theory, Equations of motion.

A microscopic theory for the interaction of charged, quantized, vortex rings in superfluid helium is suggested. The conclusion derived from this theory agree with existing macroscopic theories and experiments. The dynamics of individual vortex rings as well as effects of collisions are also discussed. (Author)

AD-914 187/0GA PC$4.75/MF$1.45
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
THERMOPHYSICAL PROPERTIES OF THERMAL ENERGY STORAGE MATERIALS - ALUMINUM.
Physical sciences research papers,
Clare C. Leiby, Jr., and Thomas G. Ryan. 18 Jul 73, 33p AFCRL-PSRP-554, AFCRL-TR-73-0421
Distribution Limitation now Removed.

Descriptors: (*Refrigeration systems, Cryogenics), (*Aluminum, *Energy conversion), (*Nickel alloys, Compatibility), (*Containers, Nickel alloys), Thermal expansion, Heat transfer, Liquid metals, Freezing, Phase studies, Solids, Heating, Solar radiation, Cooling, Melting, Spacecraft components, Heat of fusion, Infrared detectors, Thermodynamics, Iron alloys, Vacuum apparatus, Rupture, Capillary tubes, Laboratory furnaces.
Identifiers: *Nickel alloy inconel x750, Vuilleumier refrigerators, Heat pipes.

A program was initiated to determine the compatibility of inconel canisters with specific thermal energy storage materials. A uniform temperature vacuum oven and a 100-min (65 min on and 35 min off) oven control were designed and constructed. The timber-oven system generates the thermal cycle of an energy storage canister in near-earth orbit. An X-750 alloy canister was fabricated, precipitation-hardened, loaded with 215 gm of pure aluminum, and sealed off under high vacuum. It was then fitted with six thermocouples and placed in the oven for a 5000-hr test. Initial temperature measurements indicated that the aluminum alternately melted and froze during each temperature cycle. (Modified author abstract)

COO-1574-33 PC$5.50/MF$1.45
Michigan State Univ., East Lansing (Usa). Dept. Of Physics.
HELIUM II FILM TRANSFER RATES FOR SOLID-ARGON BEAKERS.
T. O. Milbrodt. 1973, 66p

Descriptors: (*Helium ii, *Mass transfer), Argon, Containers, Films, Solids.

For abstract, see NSA 29 07, number 17056.

EIR-241 PC$21.50/MF$1.45
Eidgenoessisches Inst. Fuer Reaktorforschung, Wuerenlingen (Switzerland).
HEAT TRANSFER TO FLOWING SODIUM. THEORETICAL AND EXPERIMENTAL INVESTIGATIONS ON TEMPERATURE PROFILES AND TURBULENT TEMPERATURE FLUCTUATIONS IN A TUBE.
H. Fuchs. Aug 73, 389p
In Swedish and English. U.S. Sales Only.

Descriptors: (*Sodium, *Heat transfer), Fluid flow, Liquid metals, Temperature gradients, Tubes.

For abstract, see NSA 29 07, number 15489.

LA-UR-73-1724 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
LOW-TEMPERATURE THERMAL EXPANSION OF MANGANESE DIBORIDE.
A. L. Bowman, and N. G. Nereson. 1973, 4p
CONF-731118-2
Contract W-7405-eng-36

Descriptors: (*Manganese borides, *Thermal expansion), Anisotropy, Low temperature, Neutron diffraction, Ultralow temperature, Very low temperature.

For abstract, see NSA 29 07, number 16133.

N74-16706/5GA PC$6.00/MF$1.45
Technische Hochschule, Aachen (West Germany). Stosswellenlab.
EXPERIMENTAL INVESTIGATION OF TEMPERATURE AND PRESSURE DISTRIBUTION ON HYPERSONIC VEHICLES EXPERIMENTELLE UNTERSUCHUNG DER TEMPERATUR- UND DRUCKVERTEILUNG AN HYPERSCHALLKOERPERN.
H. Groenig, and H. Schumacher. Jan 73, 56p
BMVG-FBWT-73-28
Subm-Sponsored by Bundesmin. Fuer Verteidigung.
In German; English Summary.

Descriptors: *Hypersonic reentry, *Pressure distribution, *Reentry vehicles, *Temperature distribution, *Turbulent flow, Boundary layer transition, Half cones, Hypersonic heat transfer, Laminar flow, Lifting bodies, Models, Schlieren photography, Shock tunnels.

For abstract, see STAR 1208

20N. Wave Propagation

AD-776 342/0GA PC$3.25/MF$1.45
Harry Diamond Labs Washington D C
A DISCUSSION OF EXCESSIVE RAINFALL ATTENUATIONS AT MILLIMETER WAVELENGTHS,
Walter J. Brinks. Jul 73, 31p Rept no. HDL-TM-73-14

Descriptors: *Millimeter waves, Attenuation, Rainfall, Mathematical prediction.
Identifiers: Atmospheric attenuation.

The report investigates work that has been done in the measurement and prediction of the attenuation of millimeter waves by rainfall. In this report, rainfall attenuation refers solely to that caused by the liquid phase; this is over and above that due to water vapor and the other gaseous components of the atmosphere. Also, since relatively little has been done in the actual millimeter region, attention will also be given to the neighboring short centimeter wave region. The report examines the correlation between theoretical predictions of rainfall attenuation and the attenuation actually measured. This correctly implies that the correlation is not perfect in some ways.

N74-17119/0GA PC$7.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A STUDY OF ELECTRON DENSITY PROFILES IN RELATION TO IONIZATION SOURCES AND GROUND-BASED RADIO WAVE ABSORPTION MEASUREMENTS, PART 1.
S. Gnanalingam, and J. A. Kane. Nov 73, 76p
NASA-TM-X-70586, X-625-73-355
Subm-Submitted for Publication.

Descriptors: *Electron density profiles, *Ion sources, *Ionospheric propagation, Atmospheric models, Diurnal variations, Radio waves.

For abstract, see STAR 1208

PB-230 893/0GA PC$4.00/MF$1.45
Transportation Systems Center, Cambridge, Mass.
DESCRIPTION OF A REMOTE IONOSPHERIC SCINTILLATION DATA COLLECTION FACILITY.
Interim rept. Jul 72-Mar 73,
W. E. Brown, III, G. G. Haroules, and W. I. Thompson, III. Mar 74, 95p DOT-TSC-OST-73-17

Descriptors: *Radio transmission, Scintillation, Ultrahigh frequencies, Test facilities, Ionosphere, Microwave frequencies, Coherent radiation, Remote sensing, Data acquisition.
Identifiers: L band, ATS-1 satellite, ATS-3 satellite, *Ionospheric scintillations.

An experimental technique is described which measures L-band ionospheric scintillation at a remote, unmanned site. Details of an automatic data collection facility are presented. The remote facility comprises an L-band receiver, and a complete VHF command and control telemetry link which are coupled through an integral computer. The remote facility is controlled from a central data collection facility via the VHF link through either the ATS-1 or ATS-3 spacecrafts. L-band scintillation measurements taken at the remote facility are also relayed through the spacecraft to the central facility.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-776 484/0GA Reprint
Texas Univ Austin Dept of Chemistry
ELEMENTARY REACTION RATES FROM POST-INDUCTION-PERIOD PROFILES IN SHOCK-INITIATED COMBUSTION,
W. G. Gardiner, Jr., W. G. Mallard, M. McFarland, K. Morinaga, and J. H. Owen. 1973, 17p AROD-339016-C
Grant DA-ARO-D-31-124-71-G121
Availability: Pub. in Symposium (International) on Combustion (14th), held at Pennsylvania State Univ., University Park, on 20-25 Aug 72, p61-75 1973.

Descriptors: *Combustion, *Hydrogen, *Oxygen, Reaction rates, Reaction kinetics, Carbon dioxide, Carbon monoxide, Shock waves.
Identifiers: Chemical reaction mechanisms.

Elementary reaction rates were measured by following the reaction profiles in the transition zone between the exponential growth and recombination zones in the shock-initiated combustion of H2:O2:Ar = 10:1:89, H2:O2:Ar = 1:10:89, H2:O2:CO:Ar = 1:5:3:91, and H2:O2:CO2:Ar = 5:1:4:90 mixtures in the temperature range 1200-2500K. Rate-constant expressions for the reactions OH+H2=H2O+H, OH+OH=H2O+O, OH+CO=CO2+H, were found. Possible interpretations of nonlinear Arrhenius graphs are discussed. (Modified author abstract)

AD-776 731/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CERTAIN PECULIARITIES OF COMBUSTION OF BALLASTED GASES AND STABILIZATION OF A FLAME,
V. A. Bolin, O. N. Ermolaev, and S. N. Shorin. 8 Mar 74, 9p Rept no. FTD-HT-23-872-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p68-72 1972, by Victor Mesenzeff.

Descriptors: *Combustion, *Flames, Walls, Gases, Stability, Turbulent flow, Translations, USSR.

AD-776 889/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE MECHANISM OF COMBUSTION PROPAGATION IN CERTAIN HETEROGENEOUS SYSTEMS AFTER A SHOCK WAVE,
V. F. Komov, and Ya. K. Troshin. 11 Mar 74, 5p
Rept no. FTD-HT-23-1102-74
Edited trans. of Vsesoyuznaya Mezhvuzovskaya Konferentsiya po Voprosam Isphareniya, Goreniya i Gazovoi Dinamiki Dispersnykh Sistem (5th), n.p., 1965. Tezisy Dokladov, n.p., 1965 p24-25, by Kathleen L. Dion.

Descriptors: *Combustion, Thin films, Detonations, Heterogeneity, USSR, Translations, Shock waves.

The rapid combustion of heterogeneous systems is studied, where a liquid or very viscous combustible (lubricating oil and materials, individual hydrocarbons, etc.) is applied as a thin layer 2-2000 micrometers on the surface of a duct inside which is oxygen gas.

AD-776 890/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
AN INVESTIGATION OF THE STABILITY OF THE OPERATION OF RADIAL BURNERS WITH POROUS REFRACTORY HEADS,
V. F. Zanemonets, and L. V. Gololobova. 8 Mar 74, 12p Rept no. FTD-HT-23-876-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p85-89 1972, by Ray E. Zarza.

Descriptors: *Burners, *Flames, Stability, Combustion, Porous materials, Refractory materials, Flame propogation, Translations, USSR.
Identifiers: *Flashback.

The mechanism of flashback through a porous head was explained on the basis of the theory of thermal shock. The connection between the critical temperature of the combustion surface of the porous head and the specific gas consumption and the diameter of the grains in the head was established. The limits of the stable operating modes of burners with porous refractory heads were determined.

N74-17017/6GA PC$8.25/MF$1.45
Alabama Univ., Huntsville.
CALCULATION OF EDDY VISCOSITY IN A COMPRESSIBLE TURBULENT BOUNDARY LAYER WITH MASS INJECTION AND CHEMICAL REACTION, VOLUME 1.
Final Report.
S. Omori. Dec 73, 102p NASA-CR-129019-VOL-1

Descriptors: *Chemical reactions, *Eddy viscosity, *Gas injection, *Turbulent boundary layer, Combustible flow, Compressible boundary layer, Rocket nozzles, Sweat cooling, Velocity distribution.

For abstract, see STAR 1208

N74-17018/4GA PC$15.50/MF$1.45
Alabama Univ., Huntsville.
CALCULATION OF EDDY VISCOSITY IN A COMPRESSIBLE TURBULENT BOUNDARY LAYER WITH MASS INJECTION AND CHEMICAL REACTION, VOLUME 2.
Final Report.
S. Omori. Dec 73, 249p NASA-CR-129019-VOL-2

Descriptors: *Chemical reactions, *Computer programs, *Eddy viscosity, *Gas injection, *Turbulent boundary layer, Combustible flow, Compressible boundary layer, Regenerative cooling, Rocket nozzles, Sweat cooling, Velocity distribution.

For abstract, see STAR 1208

PB-228 756/3GA PC$4.00/MF$1.45
Little (Arthur D.), Inc., Cambridge, Mass.
CHEMICAL ANALYSIS OF ODOR COMPONENTS IN DIESEL EXHAUST.
Final rept. Jun-Sep 73,
Philip L. Levins, and David A. Kendall. Sep 73, 84p ADL-74744-5 CRC-APRAC-CAPE-7-68-7
Contract EPA-68-02-0561

Descriptors: *Odors, *Exhaust gases, *Diesel engines, *Air pollution, Gas chromatography, Mass spectroscopy, Kerosene, Measuring instruments, Gas sampling.

This report covers the design, construction and evaluation on an automatic liquid chromatographic system which provides an output directly proportional to odor intensity. It is designed to be used by a technician in the laboratory to support exhaust odor emission studies. The method is based on measurement of the two principal odor character groups, kerosene and smoky-burnt, present in diesel exhaust. The method has been shown to correlate well for wide range of engine and fuel conditions.

21C. Electric Propulsion

N74-17174/5GA PC$4.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
EVALUATION OF A LIQUID MERCURY FLOWMETER FOR USE WITH ION THRUSTERS.
J. W. Pye, and S. Brabner. Aug 73, 31p RAE-TR-73086, BR36508

Descriptors: *Flowmeters, *Ion engines, *Mass flow rate, *Mercury (Metal), Performance prediction, Sensitivity, Temperature control, Temperature sensors.

For abstract, see STAR 1208

N74-17494/7GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
STUDY OF MONOPROPELLANTS FOR ELECTROTHERMAL THRUSTERS: ANALYTICAL TASK SUMMARY REPORT.
Interim Report, Mar. - Apr. 1973.
J. D. Kuenzly, and R. Grabbi. Dec 73, 49p NASA-CR-132921, TRW-22409-6010-RU-00
Contract NAS5-23202

Descriptors: *Electrothermal engines, *Feasibility analysis, *Monopropellants, Attitude control, Engine design, Hydrazines, Propellant properties.

For abstract, see STAR 1208

N74-17508/4GA PC$10.75/MF$1.45
TRW Systems, Redondo Beach, Calif.
SOLAR ELECTRIC PROPULSION/INSTRUMENT/SUBSYSTEMS INTERACTION STUDY.
Final Report.
J. M. Sellen, Jr., R. K. Cole, R. F. Kemp, D. F. Hall, and H. Shelton. 30 Mar 73, 152p NASA-CR-114732, TRW-22878-6007-RU-00
Contract NAS2-6940

Descriptors: *Data acquisition, *Solar electric propulsion, *Spacecraft propulsion, Effluents, Impact damage, Thrust control.

For abstract, see STAR 1208

N74-17510/6GA PC$11.00/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
ELECTROSTATIC PROPULSION BEAM DIVERGENCE EFFECTS ON SPACECRAFT SURFACES, VOLUME 3.
Final Report on Phase 4, Aug. 1971 - Aug. 1973.
R. F. Kemp, D. F. Hall, and E. E. Luedke. 15 Sep 73, 156p NASA-CR-136933, TRW-11985-6003-RU-00
Contracts NAS7-100, JPL-952350
Subm-Prepared for JPL.

Descriptors: *Ats 6, *Ion engines, *Ion propulsion, *Ion sources, *Spacecraft contamination, Cesium ion, Materials tests, Test facilities, Thermophysical properties.

For abstract, see STAR 1208

21D. Fuels

AD-776 762/7GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
AVIATION FUEL SPILL CONTAINMENT USING ABSORBENT MATERIALS.
Final rept. Aug-Dec 73,
Eugene E. Mazewski, and Ronald H. Kroop. Mar 74, 31p Rept no. AFWL-TR-74-9

Descriptors: *Aviation fuels, *Pollution, *Airports, Absorbers(Materials), Fire hazards.
Identifiers: *Oil spills, *Oil pollution removal, JP-4 fuel.

An evaluation on using absorbent materials to control aviation fuel spills was conducted. A literature search was made to determine what materials would be applicable. Three materials were chosen. Evaluations were made on a laboratory scale, a slightly expanded scale on actual pavement, and a full-scale field demonstration under controlled conditions. It was determined that only one of the materials was feasible for the rapid containment of small (10 to 100 gallon) fuel spills. It is recommended that a full-scale evaluation of this product be conducted at an Air Force base. (Author)

AD-776 802/1GA PC$4.00/MF$1.45
Monsanto Research Corp Dayton Ohio
ENVIRONMENTAL DEGRADATION OF FUELS, FLUIDS, AND RELATED MATERIALS FOR AIRCRAFT. VOLUME I. GENERAL STUDIES.
Final rept. 1 Dec 71-30 Nov 73,
F. Neil Hodgson, William G. Scribner, and A. Melvin Kemmer. Mar 74, 93p Rept no. MRC-DA-414-Vol-1 AFAPL-TR-74-8-Vol-1
Contract F33615-72-C-1071
See also Volume 2, AD-776 803.

Descriptors: *Aviation fuels, Fuel additives, Storage tanks, Water, Compatibility, Low temperature, Deicing materials, Contaminants.
Identifiers: Norbornadiene/methyl, JP-7 fuel, JP-TS fuel.

Research on a variety of hydrocarbon fuel properties and fuel additives is described. Studies concerning depletion of fuel system icing inhibitor from fuel upon storage and possible loss of lubricity additive upon exposure of fuels to water are discussed. Causes of fuel tank foam deterioration have been investigated and are described. Presented, also, are results from studies of the compatibility of certain fuel system materials with hydrocarbon fuels. Data are presented on high density fuels and fuel blends for which dielectric constants were measured as a function of temperature and on which low temperature behavior studies were conducted. The synthesis of the dimer of 7-methylnorbornadiene for evaluation as a high density fuel is described in detail. (Modified author abstract)

AD-776 803/9GA PC$3.25/MF$1.45
Monsanto Research Corp Dayton Ohio
ENVIRONMENTAL DEGRADATION OF FUELS, FLUIDS, AND RELATED MATERIALS FOR AIRCRAFT. VOLUME II. CLAY FILTRATION OF JP-7 AND JP-TS FUELS TO IMPROVE THERMAL STABILITY.
Final rept. 1 Dec 71-30 Nov 73,

F. Neil Hodgson, A. Melvin Kemmer, William G. Scribner, and James R. McCoy. Mar 74, 49p Rept no. MRC-DA-414-Vol-2 AFAPL-TR-74-8-Vol-2 Contract F33615-72-C-1071
See also Volume 1, AD-776 802.

Descriptors: *Aviation fuels, *Fuel filters, *Clay, Fuel contamination, Thermal stability, Portable equipment.
Identifiers: JP-7 fuel, JP-TS fuel.

An investigation of the effectiveness of filtering MIL-T-25524, Grade JP-TS and MIL-T-38219, Grade JP-7 fuels through attapulgus clay in order to improve thermal stability is described. A test apparatus was constructed on which drum quantities of the fuels could be filtered through a single cartridge containing approximately 15 pounds of clay. The removal of contaminants, added metals, and desired additives was studied. Experiments showed that 400-500 gallons of fuel could be filtered through a single cartridge, depending upon the type of contaminant. It is significant that, though saturated with respect to one or more components, the clay continued to remove low levels of polar metal compounds from the fuel. Recommendations for scale-up of the laboratory unit to a portable field unit were made. (Modified author abstract)

AD-777 047/2GA PC$3.00/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
SUBSTITUTION OF JP-5 AVIATION FUEL FOR DF-2 DIESEL UNDER FIELD CONDITIONS.
Technical note,
John S. Williams. Feb 74, 10p Rept no. NCEL-TN-1333

Descriptors: *Naval equipment, *Construction equipment, *Fuels, Diesel fuels, Jet engine fuels, Substitutes, Naval logistics.
Identifiers: JP-5 fuel, DF-2 fuel.

The report covers the work done to determine whether JP-5 aviation turbine fuel is a suitable substitute for DF-2 diesel fuel in the heavy equipment of the Naval Construction Force when such equipment is deployed on a large construction project. (Modified author abstract)

PATENT-3 243 889 Not available NTIS
Department of the Interior, Washington, D.C.
ELIMINATION OF AGGLOMERATION BY FREEZING OF LIGNITE OR OTHER MOISTURE-CONTAINING OR WETTED AGGREGATES DURING SHIPMENT.
Patent,
Robert C. Ellman, and John W. Better. Filed 23 Apr 63, patented 5 Apr 66, 2p PAT-APPL-275 171, DOCKET/MIN-521
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Lignite, *Deagglomeration, *Patents, Moisture, Metallurgical fuels.
Identifiers: PAT-CL-34-9.

It is an object of the present invention to prevent agglomeration of lignite by freezing by means of adding to the natural lignite an amount of predried lignite sufficient to prevent agglomeration. The beneficial effect of the predried lignite is believed due to removal of vaporized moisture from void spaces and particle surfaces during transit by the hygroscopic predried material.

PB-229 950/1GA PC$3.75/MF$1.45
Department of the Interior, Washington, D.C. Office of Policy Analysis.
ECONOMIC ANALYSES OF FOSSIL FUEL MARKETS USING PARAMETRIC MODELS.
Final rept.,
Robert J. Kalter. Dec 73, 64p* DOI-PEC-73-1

Descriptors: *Fossil fuels, *Marketing, Economic analysis, Economic models, Fuel consumption, Forecasting, Computerized simulation, Coal, Oil, Natural gas.

The report describes parametric models of the fossil fuel (coal, oil, and gas) markets, at two levels. First, models for individual fuels are based on historical data and assumed interactions of supply, demand, and price. Supply and demand elasticities and other significant variables are parameters which can be specified by the user. Secondly, the individual fuel models are linked through a constraint on price differential. The model is exercised for likely values of the parameters, and the implications of alternative parameter values and alternative government policies are discussed. (Author)

21E. Jet and Gas Turbine Engines

AD-776 338/6GA PC$4.50/MF$1.45
Naval Air Propulsion Test Center Trenton N J Propulsion Technology and Project Engineering Dept
TURBINE ENGINE DIAGNOSTIC DEVELOPMENT.
Rept. on Phase 2,
F. M. VanGelder. Mar 74, 113p Rept no. NAPTC-PE-29

Descriptors: *Turbofan engines, *Turbines, *Propulsion systems, Gas flow, Diagnosis(General), Computer programming, Cathode ray tubes, Display systems, Performance(Engineering).
Identifiers: TF-30 engines.

Turbine engine diagnostic development was continued, and included testing on a TF30-P-408 turbofan engine at sea level static and ram conditions. The Phase I computer program was restructured, using new mode recognition logic and adding thermodynamic performance analysis. New hardware tested included a radiation pyrometer, internal accelerometer, charged particle probe, and a programmable cathode ray tube display. Fifty parameters were monitored and a total of 90 diagnostic messages were programmed and demonstrated. (Author)

AD-776 475/6GA Reprint
Sheffield Univ (England) Dept of Chemical Engineering and Fuel Technology
COMBUSTION DESIGN FUNDAMENTALS,
J. Swithenbank, I. Poll, M. W. Vincent, and D. D. Wright. 1973, 15p AFOSR-TR-74-0355
Grant AF-AFOSR-2248-72
Prepared in cooperation with Creare, Inc., Hanover, N.H.
Availability: Pub. in Proceedings of the International Symposium on Combustion (14th), held at Pennsylvania State Univ., University Park, on 20-25 Aug 72, p627-638 1973.

Descriptors: *Combustion chambers, *Gas turbines, Mathematical models, Turbulent flow, Mixing, Shape, Stability, Performance(Engineering), Great Britain.
Identifiers: Design.

A technique for mathematically modelling combustors has been developed based on turbulent mixing concepts applied to partially stirred reactors, which takes as its starting point the geometrical shape for a given design and predicts the performance variables, such as blow-off stability limits, combustion efficiency, combustion intensity, and over-all pressure loss. Turbulence levels within the combustor are also calculated and these can be used to evaluate noise output, ignition, heat transfer, etc. The model consists of a scheme of interconnected reactors, whose individual performance is computed from a theory of partially stirred reactors which utilizes energy-balance principles to evaluate the unmixedness. Experimental verification of the model has been obtained with a high-intensity gas-turbine-type combustor, which was represented theoretically by seven interconnected reactors. This general approach can form the basis for combustor design which may be readily elaborated to improve the prediction accuracy in specific applications. (Modified author abstract)

AD-776 547/2GA PC$4.50/MF$1.45
Naval Postgraduate School Monterey Calif
CALCULATING PROCEDURE OF SEA-LEVEL STATIC PERFORMANCE OF TWO-SPOOL AFTERBURNING BYPASS JET ENGINE.
Progress rept.,
Michael H. Vavra. Jun 73, 107p Rept no. NPS-57VA73061A

Descriptors: *Jet engines, *Afterburners, Performance(Engineering), Computer programming, Low pressure, High pressure, Sea level, Thermodynamics.

A calculating procedure is presented for the sea-level static performance of duct burning and afterburning bypass jet engines that have a low pressure and a high pressure spool. Performance values can be determined also for operation without reheat. Influence of temperature and fuel/air ratio on the thermodynamic properties of air and combustion gases is taken into account. A calculating program for a Monroe 1880-43 programmable electronic desk calculator is described which makes it possible to evaluate effects of changes of parameters on performance with minimum effort. (Modified author abstract)

AD-776 740/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL DETERMINATION OF NATURAL FORMS OF VIBRATION IN BLADE ROWS WHEN FLUTTER IS PRESENT IN THE BLADES,
I. E. Zablotskii, A. G. Zaslavskii, and R. A. Shipov. 11 Mar 74, 14p Rept no. FTD-HT-23-674-74
Edited trans. of Lopatochnye Mashiny i Struynye Apparaty. Sbornik Statei (USSR) n6 p122-130 1972, by Marilyn Olaechea.

Descriptors: *Axial flow compressor blades, Flutter, Vibration, Resonant frequency, Translations, USSR.

The present study describes results of simultaneous tests on vibration amplitudes and phases of blades in the presence of flutter in axial compressor rotors.

AD-776 775/9GA PC$3.75/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
HUMAN RESOURCES SENSITIVITY TO SYSTEM DESIGN TRADEOFF ALTERNATIVES: FEASIBILITY TEST WITH JET ENGINE DATA.
Final rept.,
Kenneth D. Korkan, George W. Watts, and William B. Askren. Nov 73, 54p Rept no. AFHRL-TR-73-21

Descriptors: *Turbofan engines, *Maintainability, *Trade off analyses, Optimization, Decision making, Maintenance personnel, Engine components, Feasibility studies, Sensitivity.
Identifiers: *Decision trees, *Design criteria.

The feasibility of developing design option decision trees to a level of detail which shows hardware involved in 'on-aircraft' maintenance, and the feasibility of measuring the sensitivity of human resources data to design tradeoff problems depicted in these trees were investigated. The approach included expanding a portion of an earlier developed aircraft jet engine tree, selecting tradeoff problems from the expanded tree for sensitivity analysis, and collecting psychometric data from experienced jet engine mechanics regarding this sensitivity. Five design option decision trees were developed for turbofan jet engines. Eight tur-

bofan tradeoff problems were evaluated for affect on human resources. The factors of training and experience, and amount of troubleshooting time are affected by choice of design option in six of the eight tradeoff problems. Ease of maintenance is affected in five problems, and complexity of tools and equipment is affected in two problems. Crew size and job specialty are each affected in one problem. (Author)

AD-776 791/6GA PC$4.00/MF$1.45
Dayton Univ Ohio Research Inst
COMPUTER PROGRAMS FOR SINGLE-STAGE AXIAL COMPRESSOR TEST DATA ANALYSIS. VOLUME I. THEORY, DESCRIPTIONS, AND USER'S INSTRUCTIONS.
Final rept. 16 Jun 71-17 April 72,
Richard M. Hearsey. Dec 73, 95p* Rept no. UDRI-TR-72-20 AFAPL-TR-72-43-Vol-1, ARL-73-0177-Vol-1
Contract F33615-71-C-1751
Supersedes report dated Jun 72, AD-744 502. See also Volume 2, AD-776 792.

Descriptors: *Axial flow compressors, Instruction manuals, Computer programs, Compressor parts, Fluid dynamics, Stagnation point, Captive tests.

A pair of special-purpose computer programs have been written for the analysis of axial compressor aerodynamic test data. The axisymmetric flow of a thermal-perfect compressible fluid is assumed, and the streamline curvature method of solution is employed. By optionally incorporating details of the blade geometry in the input data, a detailed account of the flow through the blading may be obtained. A unique feature of the analysis is the option to determine annulus blockage due to boundary layers and blade wakes by utilizing experimental wall static pressure readings in addition to the usual traverses of total pressures and temperature. This first volume of two that describe the programs fully details the theory of the method, describes the computer programs, and gives all information necessary to use them. (Author)

AD-776 792/4GA PC$5.50/MF$1.45
Dayton Univ Ohio Research Inst
COMPUTER PROGRAMS FOR SINGLE-STAGE AXIAL COMPRESSOR TEST DATA ANALYSIS. VOLUME II. PROGRAM LISTINGS AND SAMPLE CALCULATIONS.
Final rept. 16 Jun 71-17 Apr 72,
Richard M. Hearsey. Dec 73, 195p* Rept no. UDRI-TR-72-21 AFAPL-TR-72-43-Vol-2, ARL-73-0177-Vol-2
Contract F33615-71-C-1751
Supersedes report dated Jun 72, AD-744 503. See also Volume 1, AD-776 791.

Descriptors: *Axial flow compressors, Instruction manuals, Computer programs, Compressor parts, Fluid dynamics, Stagnation point, Captive tests.

Contents: FORTRAN listing of program UD0100; Sample run of program UD0100; FORTRAN listing of program UD0200; Sample run of program UD0200.

AD-776 891/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
FLAMEOUT FROM PLATE STABILIZERS,
O. G. Roginskii. 8 Mar 74, 10p Rept no. FTD-HT-23-873-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p72-76 1972, by Kathleen L. Dion.

Descriptors: *Jet engines, *Burners, Combustion chambers, Nozzle gas flow, Flames, Stability, Translations, USSR.
Identifiers: *Flame stabilizers.

Injection burners of IGK (Kazantsev Injection Burners) with stabilizers of F. F. Kazantsev's design have found wide application. In the report the author gives results of a study of flameout characteristics of plate stabilizers.

AD-776 939/1GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), AH-1G GAS TURBINE ENGINE (T53-L-13B).
Interim rept. 1 Jan 64-Jul 73.
Apr 74, 23p Rept no. USAAVSCOM-TR-74-20

Descriptors: *Gas turbines, *Helicopter engines, *Logistics planning, Helicopters, Failure, Removal, Costs, Savings, Reliability.
Identifiers: T-53 engines, T-53-L-13B engines, AH-1G aircraft, H-1 aircraft, H-1G aircraft, *Maintenance support planning, *Maintenance management, 3-M system, *Maintenance data collection, Huey Cobra.

The report is designed to illustrate cost savings which would result from specific efforts in the areas of product improvement in quality and design. For the purpose of this study the cost savings produced in the area of product improvement are based on total elimination of a certain failure mode or modes. Appropriate modes are chosen because of their proportion of the total removals or their proportion in combination with other similar modes. These eliminated removals are then assumed to follow the distribution of the remaining removal modes. The actual cost savings are determined from the increase in the mean time to removal based on the new removal distributions.

AD-776 978/9GA PC$4.50/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
ADVANCED, SMALL, HIGH-TEMPERATURE-RISE COMBUSTOR PROGRAM. VOLUME II. DESIGN AND TEST OF FULL-SCALE COMBUSTION SYSTEM.
Final rept.,
Michael P. Wood, and K. M. Johansen. Feb 74, 119p USAAMRDL-TR-74-3B
Contract DAAJ02-70-C-0060
See also report dated 25 Oct 72, AD-757 173.

Descriptors: *Gas turbines, *Combustors, Combustion chambers, Fuel injection, Film cooling, Combustion, Combustion chamber liners, Experimental design.

The report describes an analytical and experimental study of advanced, small, high-temperature combustors. This volume describes the third and final phase of this program which included the design and performance verification tests of a full-scale combustion system. The objectives of the 32-month program were to develop and validate an analytical design technique for small, high-temperature-rise, low-airflow combustors and related components, and to define the limitations associated with these small combustors and related components and the effects of these limitations on the cycle and the configuration of advanced-technology engines. (Modified author abstract)

N74-16702/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RESEARCH TURBINE FOR HIGH TEMPERATURE CORE ENGINE APPLICATION. I: COLD-AIROVERALL PERFORMANCE OF SOLID SCALED TURBINE.
E. M. Szanca, H. J. Schum, and G. M. Hotz. Feb 74, 31p NASA-TN-D-7557, E-7592

Descriptors: *Aerodynamic characteristics, *Performance tests, *Scale models, *Turbine engines, Air flow, Cooling systems, Flow measurement, High temperature tests, Pressure gradients, Research projects.

For abstract, see STAR 1208

N74-16714/9GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RATIONAL FUNCTION REPRESENTATION OF FLAP NOISE SPECTRA INCLUDING CORRECTION FOR REFLECTION EFFECTS.
J. H. Miles. 1974, 30p NASA-TM-X-71502, E-7869
Conf-Presented at 12TH Aerospace Sci. Meeting, Washington, D. C., 30 Jan. - 1 Feb. 1974; Sponsored by Aiaa.

Descriptors: *Acoustic measurements, *Acoustic properties, *Sound intensity, *Sound transmission, Aerodynamic noise, Engine noise, Externally blown flaps, Jet exhaust, Turbojet engines.

For abstract, see STAR 1208

N74-16715/6GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ACOUSTIC CHARACTERISTICS OF EXTERNALLY BLOWN FLAP SYSTEMS WITH MIXER NOZZLES.
J. H. Goodykoontz, R. G. Dorsch, and J. M. Wagner. 1974, 26p NASA-TM-X-71499
Conf-Presented at the Twelfth Aerospace Sciences Meeting, Washington, D. C., 30 Jan. 1 Feb. 1974; Sponsored by Aiaa.

Descriptors: *Flaps (Control surfaces), *Noise reduction, Aircraft engines, Exhaust gases, Mixers, Nozzles.

For abstract, see STAR 1208

N74-17014/3GA PC$4.00/MF$1.45
Bucknell Univ., Lewisburg, Pa.
PARTICLE FLOW IN BLADE PASSAGES OF TURBOMACHINERY WITH APPLICATION TO LASER-DOPPLER VELOCIMETRY.
Final Report.
B. R. Maxwell. Feb 74, 36p NASA-CR-134543
Contract NGR-39-027-002

Descriptors: *Gas flow, *Microparticles, *Particle motion, *Turbine blades, *Turbomachinery, Flow characteristics, Flow measurement, Laser doppler velocimeters.

For abstract, see STAR 1208

N74-17405/3GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
JET NOISE FROM CO-AXIAL NOZZLES OVER A WIDE RANGE OF GEOMETRIC AND FLOW PARAMETERS.
W. Olsen, and R. Friedman. 1974, 30p NASA-TM-X-71503, E-7873
Conf-Presented at 12TH Aerospace Sci. Meeting, Washington, D. C., 30 Jan. - 1 Feb. 1974; Sponsored by Aiaa.

Descriptors: *Jet aircraft noise, *Nozzle flow, *Nozzle geometry, Coaxial flow, Core flow, Flow velocity, Noise reduction, Noise spectra, Parameterization, Plug nozzles.

For abstract, see STAR 1208

N74-17502/7GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SUMMARY OF RECENT INVESTIGATIONS OF INLET FLOW DISTORTION EFFECT ON ENGINE STABILITY.
E. J. Graber, Jr., and W. M. Braithwaite. 1974, 21p NASA-TM-X-71505, E-7878
Conf-Presented at 12TH Aerospace Sci. Meeting, Washington, D. C., 30 Jan. - 1 Feb. 1974; Sponsored by Aiaa.

Descriptors: *Engine inlets, *Flow distortion, *Inlet flow, *Turbofan engines, *Turbojet engines, Afterburning, Propulsion system performance, Thrust measurement.

For abstract, see STAR 1208

N74-17503/5GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN AERODYNAMIC STUDY OF SCRAMJET FUEL INJECTORS.
L. A. Povinelli. 1974, 26p NASA-TM-X-71504, E-7849
Conf-Proposed for Presentation at Symp. On the Fluid Mech. Of Combustion, Montreal, 13-16 May 1974; Sponsored by Asme and Can. Soc. Of Mech. Eng.

Descriptors: *Aerodynamic drag, *Flow distribution, *Fuel injection, *Supersonic combustion ramjet engines, Equipment specifications, Flow resistance, Gas flow, Helium.

For abstract, see STAR 1208

N74-17504/3GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RESULTS FROM CASCADE THRUST REVERSER NOISE AND SUPPRESSION EXPERIMENTS.
O. A. Gutierrez, J. R. Stone, and R. Friedman. 1974, 38p NASA-TM-X-71500, E-7864
Conf-Presented at 12TH Aerospace Sci. Meeting, Washington, D. C., 30 Jan. - 1 Feb. 1974; Sponsored by Aiaa.

Descriptors: *Aerodynamic noise, *Cascade flow, *Noise reduction, *Turbomachine blades, Acoustic measurements, Acoustic properties, Cold flow tests.

For abstract, see STAR 1208

N74-17505/0GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PERFORMANCE OF A HYDROGEN BURNER TO SIMULATE AIR ENTERING SCRAMJET COMBUSTORS.
W. R. Russin. Feb 74, 58p NASA-TN-D-7567, L-9363

Descriptors: *Gas generators, *Performance tests, *Supersonic combustion ramjet engines, *Test facilities, Altitude simulation, Burners, Flight simulation, Gas flow, Hydrogen.

For abstract, see STAR 1208

N74-17507/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STEADY-STATE INLET TEMPERATURE DISTORTION EFFECTS ON THE STALL LIMITS OF A J85-GE-13 TURBOJET ENGINE.
C. M. Mehalic, and R. A. Lottig. Feb 74, 40p NASA-TM-X-2990, E-7626

Descriptors: *Engine failure, *Inlet pressure, *Temperature effects, *Turbojet engines, Compressor efficiency, Distortion, Performance tests.

For abstract, see STAR 1208

N74-17642/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EMISSIONS OF NITROGEN OXIDES FROM AN EXPERIMENTAL HYDROGEN-FUELED GAS TURBINE COMBUSTOR.
C. T. Norgren, and R. D. Ingebo. Feb 74, 22p NASA-TM-X-2997, E-7745

Descriptors: *Combustion chambers, *Exhaust gases, *Gas turbine engines, *Nitrogen oxides, Hydrocarbon fuels, Inlet flow.

For abstract, see STAR 1208

21F. Nuclear Propulsion

AD-776 767/6GA PC$4.00/MF$1.45
Aerospace Research Labs Wright-Patterson AFB Ohio
FEASIBILITY OF COLLOID CORE NUCLEAR REACTOR FOR ROCKET PROPULSION.
Final rept.,
Bobby N. Turman, and James M. Howard. Dec 73, 93p Rept no. ARL-73-0192

Descriptors: *Nuclear reactors, *Nuclear propulsion, *Reactor feasibility studies, Specific impulse, Reactor fuels, Colloids, Heat transfer, Criticality, Performance(Engineering).
Identifiers: CCNR(Colloid Core Nuclear Reactor), Colloid core nuclear reactor.

An in-depth study has been conducted to determine the feasibility of the colloid core nuclear reactor (CCNR) for rocket propulsion. Investigations of powder containment, reactor criticality, nuclear fuel vaporization, heat transfer, and wall erosion are discussed. Results are scaled and integrated to specify an optimized design reactor rocket engine. Rocket engine performance is evaluated with respect to velocity capability, type of fuel, and fuel loss rate. It is concluded that the CCNR rocket engine is technically feasible, that a thrust-to-weight ratio of 6:1 is obtainable at 20,000 lb thrust, and that the maximum specific impulse cannot exceed 1020 sec. Furthermore, results indicate that the CCNR shows significant performance advantages over chemical and other nuclear rocket engines for missions requiring payloads on the order of 10,000 lb, with large excess velocity capability. Recommendations are made as to the steps necessary to the further development of the colloid core nuclear reactor rocket. (Author)

COM-74-10539/6GA PC$3.25/MF$1.45
National Maritime Research Center-Galveston, Tex. Commercial Nuclear Propulsion Program.
BIBLIOGRAPHY OF MARINE NUCLEAR STANDARDS.
Technical rept.,
David B. McMichael. Feb 74, 37p* NMRC-273-34200-RI MA-RD-900-74042
Contract MA-6562

Descriptors: *Marine nuclear propulsion, *Bibliographies, Maritime nuclear reactors, Operations, Construction, Standards.

The bibliography is representative of all useful reading reference material used in the development of a workable handbook showing cross-reference to present international data and identifying areas where international committees need to be created to agree on a standardized program for nuclear ship construction and operation. The handbook was the primary undertaking of the National Maritime Research Center - Galveston FY-73 Work Program Project, Commercial Nuclear Ship Standards. The bibliography is divided into three codes: Code 1 is representative of documents deemed current, relevant and marine-related; Code 2 is representative of documents deemed relevant and marine-related; and Code 3 is representative of documents deemed to be relevant, whether or not current or marine-related.

N74-17391/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER STUDY OF EMERGENCY SHUTDOWNS OF A 60-KILOWATT REACTOR BRAYTON SPACE POWER SYSTEM.
R. C. Tew, and K. S. Jefferies. Feb 74, 32p NASA-TM-X-2979, E-7651

Descriptors: *Brayton cycle, *Computerized simulation, *Failure analysis, *Shutdowns, *Space power reactors, Coolants, Gas flow, Insertion loss, Operations research, Turbine engines.

For abstract, see STAR 1208

21H. Rocket Motors and Engines

AD-776 405/3GA PC$5.00/MF$1.45
Hercules Inc Cumberland Md Allegany Ballistics Lab
STUDY OF PRODUCTION METHODS FOR HIGH TEMPERATURE SOLID PROPELLANT MOTOR NOZZLES.
Final rept. 22 Dec 72-22 Jan 74,
T. D. McComas, A. A. Vicario, and E. D. Casseday. 1 Mar 74, 173p RK-CR-74-5
Contract DAAH01-73-C-0383

Descriptors: *Rocket nozzles, Composite materials, Carbon, Production, Processing, Graphite, Thermal properties, Structural properties, Strength(Mechanics), Solid propellant rocket engines.

The program investigated low-cost fabrication processes to permit the use of advanced materials in nozzles to achieve high performance in a severe motor environment (2000 psi - 20 sec - 100 lb/sec flow). Three materials and manufacturing processes were selected as primary candidates by an initial screening process. Detailed full-scale nozzle designs were developed for each of the candidates. Performance was evaluated in subscale motor firings. A final selection was made and is recommended for demonstration in a full size nozzle test. The sleected material is a carbon-carbon composite, manufactured from a graphite cloth layup (preform) by carbonization and successive resin infiltration/carbonization cycles for densification (> 1.45 gm/cc) and graphitization. A program plan was developed to manufacture and test the nozzle in the specified motor environment. (Author)

AD-776 768/4GA PC$3.75/MF$1.45
Bell Aerospace Co Buffalo N Y
ADVANCED EJECTOR THRUST AUGMENTATION STUDY - MASS ENTRAINMENT OF AXISYMMETRIC AND RECTANGULAR FREE JETS.
Final rept. Jun 72-Apr 73,
William Peschke. Apr 73, 67p AFFDL-TR-73-55
Contract F33615-72-C-2045

Descriptors: *Thrust augmentor nozzles, *Air entrainment, *Ejectors, Jet mixing flow, Mass, Axially symmetric flow, Nonaxisymmetric, Rectangular bodies, Subsonic characteristics, Mathematical models, Jets, Model tests, Test methods.
Identifiers: *Mass entrainment.

An experimental investigation has been performed to evaluate the entrainment characteristics of nonaxisymmetric (rectangular) primary nozzles for ejector into air application. Data are presented which show the variation in mass entrainment rates of various nozzles as related to isentropic nozzle exit velocity and distance downstream of the nozzle exit. The entrained mass flow is determined by direct measurement for an axisymmetric nozzle and for rectangular nozzles with aspect ratios of 1, 10, 25, and 50. Most of the data presented are for isentropic nozzle exit Mach numbers between about 0.08 and 0.3. Some data are presented for Mach numbers up to about 0.52. All data are for nozzles exhausting into a quiesent atmosphere. (Modified author abstract)

AD-776 954/0GA PC$5.50/MF$1.45
Georgia Inst of Tech Atlanta
NUMERICAL INVESTIGATION OF NONLINEAR AXIAL INSTABILITIES IN SOLID ROCKET MOTORS.
Contract rept. 1 Jun 73-1 Jan 74,
D. E. Kooker, and B. T. Zinn. Mar 74, 183p BRL-CR-141
Grant AF-AFOSR-2588-74

Descriptors: *Solid propellant rocket engines, *Combustion stability, Combustion, Models, Oscillation, Burning rate, Flow fields, Solid rocket propellants.

Nonlinear axial-mode combustion instability remains a serious problem in the development of solid propellant rocket motors. Although the use of metal-loaded solid propellants which produce solid particles in the flow has reduced the occurrence of high frequency instabilities, it has not eliminated the axial-mode intermediate frequency (100 - 1000 Hz.) problem. If such an instability reaches a large amplitude limit cycle, it may lead to an increase in mean chamber pressure and burning rate, excessive heat transfer rates, and a severe vibration level. The objective of this report is to investigate the complex coupling between the chamber flow conditions and the solid propellant combustion process which may lead to large amplitude longitudinal instabilities. (Modified author abstract)

N74-17506/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SOME INJECTOR ELEMENT DETAIL EFFECTS ON SCREECH IN HYDROGEN-OXYGEN ROCKETS.
N. P. Hannum, L. M. Russell, D. W. Vincent, and E. W. Conrad. Feb 74, 41p NASA-TM-X-2982, E-7512

Descriptors: *Combustion stability, *Engine tests, *Hydrogen oxygen engines, *Injectors, Concentricity, Performance, Pressure reduction.

For abstract, see STAR 1208

N74-17511/8GA PC$5.75/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
DETERMINATION OF THE AVAILABILITY OF APPROPRIATE AGED FLIGHT ROCKET MOTORS.
P. J. Martin. 11 Jan 74, 52p NASA-CR-136864
Contracts NAS7-100, JPL-953298
Subm-Prepared for JPL.

Descriptors: *Captive tests, *Performance tests, *Rocket engine cases, *Solid propellant rocket engines, Data acquisition, Failure analysis, Propellant combustion, Propellant properties.

For abstract, see STAR 1208

N74-17646/2GA PC$7.50/MF$1.45
Rocketdyne, Canoga Park, Calif.
ANALYTICAL AND EXPERIMENTAL STUDY OF RESONANCE IGNITION TUBES.
Final Report.
L. Stabinsky. 12 Dec 73, 87p NASA-CR-136934, R-9403
Contracts NAS7-100, JPL-953563
Subm-Prepared for JPL.

Descriptors: *Gas dynamics, *Ignition systems, *Resonance, *Rocket engines, Hydrazine engines, Hydrogen oxygen engines, Ignition limits, Monopropellants.

For abstract, see STAR 1208

21I. Rocket Propellants

AD-913 513/8GA PC$18.50/MF$1.45
Thiokol Chemical Corp., Huntsville, Ala. Huntsville Div.
DEVELOPMENT OF ULTRAFINE AMMONIUM PERCHLORATE TECHNOLOGY.
Final rept. Mar 72-Apr 73,
D. A. Flanigan, W. D. Stephens, and S. L. Vance.
Sep 73, 310p 26-73 AFRPL-TR-73-67
Contract F04611-72-C-0061
Distribution Limitation now Removed.

Descriptors: *Ammonium perchlorate, Manufacturing methods, *Solid rocket oxidizers, *Solid rocket propellants, Handling, Storage, Coatings, Humidity, Temperature, Hazards, Transportation, Viscosity, Shear stresses, Butadienes, Burning rate, Thermal stability, Processing, Plastic coatings.

Identifiers: UFAP(Ultrafine Ammonium Perchlorate), *Ultrafine Ammonium Perchlorate.

Ultrafine ammonium perchlorate (UFAP) handling, storage, and shipping properties were investigated with respect to product coatings, solid propellant formulation processing and rocket ballistic parameters. Approximately 40 compounds were evaluated and six materials were identified that protect UFAP from particle growth during storage and handling. It was demonstrated that coated UFAP could be stored for several months under low (30%)R. H. humidity and temperatures to 60C, but not under high humidity and temperature. Hazard and shipping tests showed UFAP could be shipped as DOT class B if it contained 30% of sorbeads as a diluent/modifier. Ballistic and processing evaluations showed wide variations in properties with different types and blends of UFAP and different coating materials. (Author)

N74-16996/2GA PC$6.00/MF$1.45
Rocket Propulsion Establishment, Westcott (England).
THE PRODUCTION OF LIQUID HYDROGEN AT THE ROCKET PROPULSION ESTABLISHMENT.
R. Bainbridge, and T. R. Horton. Dec 71, 60p RPE-TR-71/17, BR36685

Descriptors: *Liquid hydrogen, *Production engineering, Condensers (Liquifiers), Industrial plants, Liquefaction, Safety factors.

For abstract, see STAR 1208

N74-17495/4GA PC$5.75/MF$1.45
Aerojet Solid Propulsion Co., Sacramento, Calif.
A STUDY OF THE EFFECTS OF SOLID PHASE REACTIONS ON THE THERMAL DEGRADATION AND BALLISTIC PROPERTIES OF SOLID PROPELLANTS.
W. G. Schmidt. Feb 74, 54p NASA-CR-132357
Contract NAS1-11702

Descriptors: *Composite propellants, *Perchlorates, *Thermal degradation, *Thermal stability, Mass spectroscopy, Nitronium perchlorate, Oxidizers, Polyethylenes, Potassium perchlorates, Thermogravimetry.

For abstract, see STAR 1208

N74-17496/2GA PC$6.50/MF$1.45
Drexel Univ., Philadelphia, Pa.
CURRENT STATUS OF FREE RADICALS AND ELECTRONICALLY EXCITED METASTABLE SPECIES AS HIGH ENERGY PROPELLANTS.
Final Technical Report.
G. Rosen. Aug 73, 69p NASA-CR-136938
Contracts NAS7-100, JPL-953623
Misc-Revised. Subm-Prepared for JPL.

Descriptors: *Free radicals, *High energy propellants, *Metastable state, *Rocket propellants, Excitation, Helium, Hydrogen, Nitrogen, Oxygen.

For abstract, see STAR 1208

N74-17497/8GA PC$6.00/MF$1.45
Institut fuer Chemie der Treibstoffe, Berghausen (West Germany).
DETERMINATION OF LIFETIME OF SOLID ROCKET PROPELLANTS. INFLUENCE OF BURNING MODERATORS ON THE CHEMICAL STABILITY OF DOUBLE BASE SOLID PROPELLANTS DIE BESTIMMUNG DER LEBENSDAUER VON RAKETEN FESTTREIBSTOFFEN. DER EINFLUSS VON ABBRANDMODERATOREN AUF DIE CHEMISCHE STABILITAET VON DOUBLEBASE-FESTTREIBSTOFFEN.
F. Volk. 30 Nov 72, 56p ICT-2/72
Language in German.

Descriptors: *Double base rocket propellants, *Moderators, *Stability tests, *Thermal stability, Autocatalysis, Life (Durability), Propellant tests, Storage stability, Thermal degradation.

For abstract, see STAR 1208

22. SPACE TECHNOLOGY

22A. Astronautics

AD-776 921/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
WHAT ARE THE SOVIET SCIENTISTS WORKING ON.
26 Mar 74, 6p Rept no. FTD-HT-23-1200-74
Edited trans. of Komsomolskaya Pravda (USSR) n246 p4, 20 Oct 73, by Robert D. Hill.

Descriptors: *Scientific research, *Aerospace medicine, Space flight, Weightlessness, Electrostatics, Astronautics, USSR, Translations.

A brief review of research in Soviet space medicine is reported.

AD-776 933/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONVERSATION WITH SPACE,
B. Knonovalov. 26 Mar 74, 7p Rept no. FTD-HT-23-1532-74
Edited trans. of Izvestiya (USSR) n30 p3, 26 Dec 73, by Charles T. Ostertag, Jr.

Descriptors: *Space biology, *Aerospace medicine, Space flight, Stress(Physiology), Weightlessness, Brain, Blood circulation, Chlorella, Algae, Plants(Botany), USSR, Translations.
Identifiers: Soyuz 13 spacecraft.

Experiments being carried out on the effects of weightlessness on plants and animals are described on the Soyuz 13 flight.

AD-776 944/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SPACE 'LEVKOI',
Ya. Golovanov. 25 Mar 74, 6p Rept no. FTD-HT-23-1531-74
Edited trans. of Komsomolskaya Pravda (USSR) n299 p2, 25 Dec 73, by Charles T. Ostertag, Jr.

Descriptors: *Blood circulation, *Weightlessness, *Aerospace medicine, Brain, Cerebrum, Adaptation(Physiology), Test methods, Stress(Physiology), USSR, Translations.
Identifiers: Soyuz 13 spacecraft.

The flights of Soviet and American astronauts made it possible to note certain general regularities in well-being during the so-called transition period - during the first days of flight when the organism is becoming adjusted to the conditions of weightlessness. Gravity is absent, the heart does not have to expend energy for raising the blood from the lower parts of the body to the upper. But the heart still doesn't know about this and it continues to pump blood as it pumped it on earth. There is a redistribution of blood. An excess of it, making up around eleven percent, flows into the chest cavity and into the brain. In some this redistribution doesn't have any effect on efficiency. Others experience a heaviness in the head, they become motion sick, and naturally it is more difficult for them to work in space.

JPRS-61355 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
THROUGH THE ATMOSPHERES OF THE PLANETS,
A. Serov. 28 Feb 74, 10p

Trans. of Aviatsiya i Kosmonavtika (USSR) n4 p34-35, 37 Apr 73.

Descriptors: *Planetary landing, *Mars(Planet), *Venus(Planet), Soft spacecraft landing, Translations, USSR.

The report contains an interview with A. Serov a specialist in the field of designing automatic interplanetary stations.

N74-17384/0GA PC$9.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
FEASIBILITY TEST FOR A V-SLIT STAR MAPPER FOR PIONEER SPACECRAFT TERMINAL NAVIGATION.
Final Report.
R. F. Gates, J. V. Flannery, and J. T. Cragin. Nov 73, 123p NASA-CR-114734, R-7537-2-451
Contract NAS2-7597

Descriptors: *Astrography, *Pioneer space probes, *Space navigation, Breadboard models, Feasibility analysis, Terminal guidance.

For abstract, see STAR 1208

N74-17538/1GA PC$4.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
UNMANNED SURFACE TRAVERSES OF MARS AND MOON: SCIENCE OBJECTIVES, PAYLOADS, OPERATIONS.
L. D. Jaffe, and R. Choate. 8 Jun 73, 41p NASA-CR-136810
Contract NAS7-100
Subm-Backup Document for Aiaa Synoptic Scheduled for Publication in Journal of Spacecraft and Rockets in June 1974.

Descriptors: *Lssm, *Lunar roving vehicles, *Mars surface, *Remote control, *Roving vehicles, Data acquisition, Ground based control, Payloads, Systems engineering.

For abstract, see STAR 1208

N74-17539/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DYNAMICS AND COLUMN DENSITIES OF SMALL PARTICLES EJECTED FROM SPACECRAFT.
R. J. Naumann. Feb 74, 37p NASA-TN-D-7590, M-460

Descriptors: *Flux density, *Orbital mechanics, *Particle emission, *Particle trajectories, Drag, Orbit perturbation, Orbital velocity, Spacecraft trajectories.

For abstract, see STAR 1208

N74-17541/5GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A CONCEPTUAL DESIGN AND OPERATIONAL CHARACTERISTICS FOR A MARS ROVER FOR A 1979 OR 1981 VIKING SCIENCE MISSION.
W. L. Darnell, and V. W. Wessel. Feb 74, 89p NASA-TN-D-7462, L-9254

Descriptors: *Mars surface, *Roving vehicles, *Viking mars program, Feasibility analysis, Surface vehicles, Systems engineering, Viking lander spacecraft, Weight (Mass).

For abstract, see STAR 1208

N74-17542/3GA PC$5.25/MF$1.45
Northrop Services, Inc., Huntsville, Ala.
STATISTICAL ANALYSIS OF FLIGHT TIMES FOR SPACE SHUTTLE FERRY FLIGHTS.
M. E. Graves, and M. Perlmutter. Jan 74, 41p NASA-CR-129021
Contract NAS8-21810

Descriptors: *Flight time, *Space shuttle orbiters, *Statistical analysis, Flight simulation, Markov chains, Monte carlo method, Statistical distributions.

For abstract, see STAR 1208

22B. Spacecraft

BMBW-FB-W-72-25 PC$5.45/MF$1.45
Zentralstelle fuer Luft- und Raumfahrtdokumentation und -Information, Muenchen (F.R. Germany).
COMPATIBILITY STUDY FOR AN ASTRONOMICAL SATELLITE A-6. PART I. SCIENTIFIC OBJECTIVES AND EXPERIMENTS.
J. Truemper, V. Schoenfelder, H. Elsaesser, D. Lemke, and M. Grewing. Aug 72, 125p
In German. U.S. Sales Only.

Descriptors: (*Satellites, Cosmic radiation), (*Cosmic radiation, *X radiation), Background radiation, Cosmic x-ray sources, Infrared radiation, Stars, Ultraviolet radiation.

For abstract, see NSA 29 07, number 16457.

N74-17589/2GA PC$7.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SOLAR ARRAY STUDY FOR SOLAR ELECTRIC PROPULSION SPACECRAFT FOR THE ENCKE RENDEZVOUS MISSION.
E. A. Sequeira, and R. E. Patterson. 1 Feb 74, 87p NASA-CR-136860, JPL-TM-33-668
Contract NAS7-100

Descriptors: *Mission planning, *Rendezvous spacecraft, *Solar electric propulsion, Solar arrays, Spacecraft power supplies, Systems analysis, Weight analysis.

For abstract, see STAR 1208

N74-17552/2GA PC$4.00/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
RESONANCE EFFECTS IN DECAYING SATELLITE ORBITS, AND THEIR USE IN STUDIES OF THE GEOPOTENTIAL.
D. G. King-hele. May 73, 16p RAE-TM-SPACE-196, BR36383
Conf-Presented at the 1ST Intern. Symp. On the Use of Artificial Satellites for Geodesy and Geodyn., Athens, May 1973.

Descriptors: *Geopotential, *Orbit decay, *Resonance, *Satellite orbits, Circular orbits, Harmonic analysis, Orbital elements, Satellite perturbation.

For abstract, see STAR 1208

N74-17561/3GA PC$56.25/MF$1.45
Chrysler Corp., New Orleans, La. Data Management Services.
STATIC STABILITY AND CONTROL EFFECTIVENESS OF MODELS 12-0 AND 34-0 OF THE VEHICLE 3 CONFIGURATION, VOLUME 2.
E. C. Allen, and T. Tuttle. Aug 73, 1065p NASA-CR-128780, DMS-DR-2055-VOL-2
Contract NAS9-13247
Seri-3.

Descriptors: *Controllability, *Structural stability, *Wind tunnel tests, Angle of attack, Longitudinal stability, Mach number, Tables (Data).

For abstract, see STAR 1208

N74-17564/7GA PC$4.50/MF$1.45
EMR Aerospace Sciences, College Park, Md.
IMP J SUMMARY TECHNICAL REPORT.
Dec 73, 29p NASA-CR-132932
Contract NAS5-11211

Descriptors: *Imp, *Quality control, *Satellite design, Explorer satellites, Fabrication, Failure analysis, Mission planning.

For abstract, see STAR 1208

N74-17565/4GA PC$8.50/MF$1.45
Operations Research, Inc., Silver Spring, Md.
ON BOARD SATELLITE PROCESSING STUDY.
Final Report.
D. L. Reed. May 73, 107p NASA-CR-132931, TR-771
Contract NAS5-21645

Descriptors: *Artificial satellites, *Data systems, *Data transmission, *Space communication, Data processing, Geological surveys, Mapping, Navigation satellites, Oceanography, Systems analysis.

For abstract, see STAR 1208

N74-17568/8GA PC$11.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
HEAT TRANSFER AND PRESSURE DISTRIBUTIONS AT M EQUALS 8 ON 0.029 SCALE MODELS OF THE VIKING ENTRY VEHICLE.
R. Faye-petersen, D. Sarver, and H. Carroll. Jul 72, 156p NASA-CR-132413, TP-3720318
Contract NAS1-9000

Descriptors: *Hypersonic speed, *Pressure distribution, *Viking lander spacecraft, *Wind tunnel tests, Aerodynamic characteristics, Angle of attack, Boundary layer flow, Flow geometry.

For abstract, see STAR 1208

N74-17569/6GA PC$44.00/MF$1.45
Chrysler Corp., New Orleans, La. Space Div.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 11.
R. H. Spangler. Oct 73, 819p NASA-CR-128794-VOL-11, DMS-DR-2032-VOL-11
Contract NAS9-13247

Descriptors: *Aerodynamic loads, *Pressure measurements, *Space shuttle orbiters, *Wind tunnel tests, Aerodynamic configurations, Fuselages, Mach number, Nozzle efficiency, Tables (Data), Wings.

For abstract, see STAR 1208

N74-17570/4GA PC$58.50/MF$1.45
Chrysler Corp., New Orleans, La. Space Div.
RESULTS OF TESTS OA12 AND IA9 IN THE AMES RESEARCH CENTER UNITARY PLAN WIND TUNNELS ON AN 0.030-SCALE MODEL OF THE SPACE SHUTTLE VEHICLE 2A TO DETERMINE AERODYNAMIC LOADS, VOLUME 12.
R. H. Spangler. Oct 73, 1179p NASA-CR-128794-VOL-12, DMS-DR-2032-VOL-12
Contract NAS9-13247

Descriptors: *Aerodynamic loads, *Pressure measurements, *Space shuttle orbiters, *Wind tunnel tests, Aerodynamic configurations, Mach number, Space shuttle boosters, Tables (Data), Tail surfaces, Wings.

For abstract, see STAR 1208

N74-17572/0GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

DYNAMICS OF FLEXIBLE SPINNING SATELLITES WITH RADIAL WIRE ANTENNAS.
R. W. Longman, and J. V. Fedor. Sep 73, 33p
NASA-TM-X-70584, X-732-73-233

Descriptors: *Dynamic models, *Satellite antennas, *Satellite rotation, Bessel functions, Equations of motion, Resonant frequencies, Spin-orbit interactions, Structural weight, Time functions, Vibration mode.

For abstract, see STAR 1208

N74-17573/8GA PC$14.00/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
EVALUATION OF A METAL FUSELAGE PANEL SELECTIVELY REINFORCED WITH FILAMENTARY COMPOSITES FOR SPACE SHUTTLE APPLICATION.
Final Report.
W. F. Wennhold. Jan 74, 217p NASA-CR-132380
Contract NAS1-10766

Descriptors: *Composite structures, *Reinforced plastics, *Reinforcing fibers, *Space shuttles, *Spacecraft components, Compression tests, Compressive strength, Epoxy resins, Synthetic fibers.

For abstract, see STAR 1208

N74-17577/9GA PC$4.25/MF$1.45
Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Space Div.
PROBLEMS OF OBSERVER DESIGN.
E. Bruederle, J. L. Santana, and H. Weingarten. 1973, 22p
Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Attitude stability, *Controllers, *Satellite attitude control, *Synchronous satellites, Feedback control, Friction, Radiation pressure, Signal to noise ratios, Solar radiation, Torque.

For abstract, see STAR 1208

N74-17579/5GA PC$5.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany).
SELECTION OF MATERIALS AND COMPONENTS FOR SPACECRAFT.
W. Wilkens. 1973, 39p
Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Helios satellites, *Outgassing, *Spacecraft construction materials, *Thermal control coatings, Space environment simulation, Spacecraft components, Spacecraft contamination.

For abstract, see STAR 1208

N74-17582/9GA PC$4.00/MF$1.45
Centre d'Etudes et de Recherches, Toulon (France). Dept. d'Etudes et de Recherches en Automatique.
VALIDITY CONDITIONS OF MATHEMATICAL MODEL SIMULATION CONDITIONS DE VALIDITE D'UNE SIMULATION PARMODELE MATHEMATIQUE.
J. Lemaitre. 1973, 9p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.
Language in French.

Descriptors: *Mathematical models, *Meteosat satellite, *Satellite attitude control, Communication satellites, Flight simulation.

For abstract, see STAR 1208

N74-17638/9GA PC$5.75/MF$1.45
Martin Marietta Corp., Denver, Colo.
STUDY OF CRITICAL DEFECTS IN ABLATIVE HEAT SHIELD SYSTEMS FOR THE SPACE SHUTTLE.
Final Report.
C. C. Miller, and W. D. Rummel. Feb 74, 210p
NASA-CR-2336, MCR-73-184
Contract NAS1-10289

Descriptors: *Heat shielding, *Space shuttles, Ablative materials, Ablative nose cones, Deformation.

For abstract, see STAR 1208

N74-17644/7GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
AN EFFICIENCY STUDY ON OBTAINING THE MINIMUM WEIGHT OF A THERMAL PROTECTION SYSTEM.
S. D. Williams, and D. M. Curry. Jan 74, 12p
NASA-TM-X-58126, JSC-08678

Descriptors: *Least squares method, *Thermal protection, Numerical analysis, Optimization, Space shuttles.

For abstract, see STAR 1208

N74-17645/4GA PC$5.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
EFFECTS OF SELECTED TRAJECTORY PARAMETERS ON WEIGHT TRENDS IN THE SHUTTLE THERMAL PROTECTION SYSTEM.
D. M. Curry, J. W. Tolin, Jr., and W. D. Goodrich. Jan 74, 39p NASA-TM-X-58113, JSC-08585

Descriptors: *Ablative materials, *Aerothermodynamics, *Thermal protection, Optimization, Space shuttle orbiters, Spacecraft reentry, Structural weight, Trajectory analysis.

For abstract, see STAR 1208

22C. Spacecraft Trajectories and Reentry

AD-777 015/9GA PC$5.00/MF$1.45
Virginia Univ Charlottesville Research Labs for the Engineering Sciences
NEW ANALYTICAL METHODS FOR SIMULATION/ESTIMATION OF ASYMMETRIC SATELLITE DYNAMICS.
Final rept. Sep 72-Dec 74,
John L. Junkins, and Jeffery N. Blanton. Dec 73, 157p Rept no. RLES-ESS-3323-101-73 ETL-CR-73-21
Contract DAAK02-73-C-0041

Descriptors: *Satellite attitude, *Satellites(Artificial), *Equations of motion, *Dynamics, Partial differential equations, Asymmetric bodies, Time series analysis, Numerical integration, Computations, Computer programs.
Identifiers: Elliptic differential equations.

The classical solution for the torque free motion of an asymmetric rigid body is summarized. The branched nature of this solution and the singularities inherent in the classical 3-1-3 Euler angle (or any 3 parameter) representation of attitude provides the impetus to search for new universal solutions. Two new solutions which are singularity free have been derived thus avoiding difficulties encountered in the classical solution. These new solutions are based on an Euler parameter representation of attitude. This once redundant four parameter set avoids geometrical singularities implicit in all three parameter descriptions of orientation. (Modified author abstract)

N74-16893/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A NEW METHOD FOR SATELLITE ORBIT DETERMINATION USING AN OPERATIONAL WORLDWIDE TRANSPONDER NETWORK.
J. J. Lynn, P. E. Schmid, and R. E. Anderson. Jan 74, 21p NASA-TM-X-70587, X-591-74-2
Conf-Presented at the American Geophysical Union Fall Annual Meeting, San Francisco, 10-13 Dec. 1973.

Descriptors: *Orbit calculation, *Tracking networks, *Transponders, Ats 3, Computer programs, Ionospheric propagation, Tdr satellites, Very high frequencies.

For abstract, see STAR 1208

N74-16941/8GA PC$6.50/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
THE LOOK-ANGLE PREDICTION PROGRAMS PLAP ESPLAP AND 6130PLAP.
R. H. Gooding, and A. W. Odell. Aug 73, 70p
RAE-TR-73088, BR36548

Descriptors: *Azimuth, *Computer programs, *Earth satellites, *Elevation angle, Fortran, Orbital elements, Predictions.

For abstract, see STAR 1208

N74-16979/8GA PC$8.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Mission Analysis Div.
TRACKING SYSTEM ANALYTIC CALIBRATION ACTIVITIES FOR THE MARINER MARS 1971 MISSION.
G. A. Madrid, C. C. Chao, H. F. Fliegel, R. K. Leavitt, and N. A. Mottinger. 1 Mar 74, 105p
NASA-CR-136826, JPL-TR-32-1587
Contract NAS7-100

Descriptors: *Calibrating, *Mariner program, *Mars 71 project, *Orbit calculation, *Tracking networks, Charged particles, Data smoothing, Radio signals, Spacecraft guidance, Tropospheric scattering.

For abstract, see STAR 1208

N74-17319/6GA PC$6.00/MF$1.45
Technischen Universitaet, Munich (West Germany). Inst. fuer Astronomische und Physikalische Geodaesie.
REPRESENTATION OF THE MOTION OF A SATELLITE IN AN ANISOTROPIC GRAVITATIONAL FIELD BY POWER-SERIES DARSTELLUNG DER BEWEGUNG EINES SATELLITEN IN EINEM BELIEBIGEN ANISOTROPEN GRAVITATIONSFELD MIT HILFE VON POTENZREIHEN.
G. O. Dichtl. Sep 73, 60p BMFT-FBW-73-17
Contracts WRK-132, SFB-78
In German; English Summary.

Descriptors: *Anisotropy, *Equations of motion, *Gravitational fields, *Power series, *Satellite orbits, Euler-lagrange equation, Inertial coordinates, Numerical integration, Recursive functions, Satellite perturbation.

For abstract, see STAR 1208

N74-17534/8GA PC$11.00/MF$1.45
Ohio State Univ. Research Foundation, Columbus. Dept. of Geodetic Science.
CRITICAL CONFIGURATIONS (DETERMINANTAL LOCI) FOR RANGE AND RANGE DIFFERENCE SATELLITE NETWORKS.
E. Tsimis. Jan 73, 159p NASA-CR-136943, DGS-191
Contracts NGR-36-008-093, OSURF PROJ. 2514

Descriptors: *Geodetic satellites, *Geodetic surveys, *Satellite networks, *Satellite tracking, Applications of mathematics, Ground tracks, Numerical analysis, Satellite orbits.

For abstract, see STAR 1208

N74-17537/3GA PC$3.00/MF$1.45
Stanford Univ., Calif. Center for Systems Research.
INVESTIGATION OF HALO SATELLITE ORBIT CONTROL.
Final Report.
J. V. Breakwell. Oct 73, 8p NASA-CR-132858
Contract NGR-05-020-507

Descriptors: *Halo orbit space station, *Orbit calculation, *Spacecraft control, Costs, Random errors, Stationkeeping, Truncation errors.

For abstract, see STAR 1208

N74-17540/7GA PC$11.50/MF$1.45
Analytical Mechanics Associates, Inc., Los Angeles, Calif.
RADIO ASTRONOMY EXPLORER-B IN-FLIGHT MSSION CONTROL SYSTEM DEVELOPMENT EFFORT.
Final Report.
D. A. Lutsky, W. S. Bjorkman, and C. Uphoff.
Mar 73, 166p NASA-CR-132924, REPT-73-8
Contract NAS5-11900

Descriptors: *Command and control, *Computer programs, *Preflight analysis, *Translunar injection, Display devices, Fortran, Logistics, Midcourse guidance, Radio astronomy explorer satellite.

For abstract, see STAR 1208

N74-17551/4GA PC$4.50/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
ANALYSIS OF THE ORBIT OF 1970-65D, COSMOS 259 ROCKET.
D. M. C. Walker. Aug 73, 30p RAE-TR-73110, BR36622

Descriptors: *Atmospheric density, *Cosmos satellites, *Geopotential, *Orbit calculation, *Upper atmosphere, Computer programs, Harmonic analysis, Optical tracking, Orbit decay, Orbit perturbation, Perigees, Rotation, Satellite orbits, Satellite tracking, Winds aloft.

For abstract, see STAR 1208

N74-17563/9GA PC$21.00/MF$1.45
Weston Instruments, Inc., College Park, Md. EMR Div.
IMP I, H, AND J.
Final Report.
Nov 73, 399p NASA-CR-132926
Contract NAS5-11211

Descriptors: *Artificial satellites, *Imp, *Mission planning, *Satellite design, *Space missions, Operations research, Orbital mechanics, Spacecraft launching, Trajectory analysis.

For abstract, see STAR 1208

N74-17576/1GA PC$5.00/MF$1.45
British Aircraft Corp. (Operating) Ltd., Bristol (England).
THE HYBRID SIMULATION OF A DUAL-SPIN SPACECRAFT.
C. Edgcombe, J. A. Holt, and N. Swift. 1973, 40p
Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Analog simulation, *Digital simulation, *Dual spin spacecraft, *Nutation dampers, Asymmetry, Balance, Hybrid computers, Liquid sloshing, Spin reduction.

For abstract, see STAR 1208

N74-17578/7GA PC$4.00/MF$1.45
Louvain Univ. (Belgium).
ESTIMATION OF SATELLITE DYNAMICS BY MEANS OF NONLINEAR FILTERING.
P. Y. Willems. 1973, 16p
Conf-Presented at the Intern. Seminar on Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Attitude stability, *Nonlinear filters, *Satellite attitude control, Estimating, Many body problem, Mathematical models.

For abstract, see STAR 1208

N74-17584/5GA PC$5.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
TABLE OF EARTH SATELLITES. VOLUME 2. PART 4: 1972.
J. A. Pilkington, D. G. King-hele, and H. Hiller. Jul 73, 55p RAE-TR-73070, BR36334

Descriptors: *Artificial satellites, *Satellite lifetime, *Satellite orbits, Size (Dimensions), Tables (Data), Weight (Mass).

For abstract, see STAR 1208

22D. Spacecraft Launch Vehicles and Ground Support

N74-16978/0GA PC$8.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FIRST HEATED JETTISON TEST ON THE CENTAUR STANDARD SHROUD.
Jan 74, 122p NASA-TM-X-71501, E-7868

Descriptors: *Centaur launch vehicle, *Jettisoning, *Shrouds, *Test facilities, Graphs (Charts), Heating equipment, Photographic recording, Thermal simulation.

For abstract, see STAR 1208

N74-17566/2GA PC$11.50/MF$1.45
General Dynamics Corp., San Diego, Calif. Convair Aerospace Div.
ATLAS F ENTRY AEROTHERMIC STUDY.
Final Report.
Dec 72, 167p NASA-CR-132409, GDCA-BGJ72-017
Contract F04701-72-C-0054
Subm-Sponsored in Part by NASA.

Descriptors: *Aerodynamic heat transfer, *Atlas launch vehicles, Boundary layer transition, Catalytic activity, Feasibility analysis, Rarefied gases, Wind tunnel tests.

For abstract, see STAR 1208

N74-17571/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APOLLO SATURN 511 EFFLUENT MEASUREMENTS FROM THE APOLLO 16 LAUNCH OPERATIONS: AN EXPERIMENT.
G. L. Gregory, W. C. Hulten, and D. E. Wornom.
Mar 74, 16p 0NASA-TM-X-2910, 0L-9097

Descriptors: *Apollo 16 flight, *Exhaust gases, *Saturn launch vehicles, Air sampling, Carbon monoxide, Hydrocarbons, Particulate sampling.

For abstract, see STAR 1208

N74-17583/7GA PC$5.25/MF$1.45
Office National d'Etudes et de Recherches Aerospatiales, Toulouse (France). Dept. d'Etudes et de Recherches en Automatique.
CONTROL OF SPACE LAUNCHERS.
J. P. Jung, and L. Leletty. 1973, 45p
Conf-Presented at the Intern. Seminar Simulation and Space, Toulouse, 10-14 Sep. 1973.

Descriptors: *Compensators, *Diamant launch vehicle, *Spacecraft launching, Dynamic control, Optimal control.

For abstract, see STAR 1208

REPORT LOCATOR LIST

This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 74, Number 11.**

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04B AD-776 307/1GA
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06E AD-776 310/5GA
04B AD-776 311/3GA
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01E PB-230 355/0GA
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13B PB-230 436/8GA
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09B PB-230 444/2GA
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